102662

RECORD OF DECISION

Berks Sand Pit Site
Longswamp Township
Berks County, Pennsylvania

Statement of Basis and Purpose

This decision document presents the selected final remedial action for the Berks Sand Pit Site in Berks County Pennsylvania, developed in accordance with the Comprehensive Environmental Response, Compensation Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and to the extent practicable, the National Contingency Plan. This decision is based on the administrative record for this site. The attached index identifies the items that comprise the administrative record upon which the selection of the remedial action is based. The Commonwealth of Pennsylvania has concurred in the selected remedy.

Description of the Selected Remedy

This remedy will address all the contaminants of concern at the Berks Sand Pit Site and will be considered the final remedy after implementation and operations of the groundwater treatment system. The remedy will include:

- excavation of contaminated sediments and offsite treatment and disposal by incineration
- installation and operation of a groundwater extraction system to remove contaminants from the aquifer
- construction and operation of an air stripper with vapor phase carbon absorption and the discharge of the treated water to the aquifer by injection wells.
- construction of an alternate water supply system
- chemical and biological monitoring of the surface and ground water quality
- local restrictions to prevent any further drinking water wells in the contaminated areas of the aquifer

Declaration

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate for this remedial action, and is cost effective. This remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Stanley L. Laskowski
Acting Regional Administrator

9-29-88
Date

THE DECISION SUMMARY

Site Location and Description

The Berks Sand Pit site is located in Longswamp Township, Berks County, Pennsylvania (Figure 1). The site is approximately 15 miles northeast of Reading, near the Villages of Huffs Church, Seisholtzville and Mertztown. The area of the site investigation is approximately 3 to 4 acres and there are at least 20 single homes within the investigation area. The actual sand pit was located on one of the residential lots where a home is now built. Figure two shows a sketch Berks Sand Pit Site and the area of the former sand pit.

The Berks Sand Pit originally was created by the removal of sand and gravel from the area. The size of the pit was approximately 100 feet in diameter and 30 feet deep. The pit reportedly was used by area residents for refuse disposal. Industrial waste also was alleged to have been disposed of in the area around the pit. Houses were constructed and private wells installed at this location beginning in 1978, after the pit was backfilled. In fact one home was built directly on top of the pit. During January 1982, groundwater contamination was detected in the area by the residents, and despite emergency actions taken by EPA, no pocket of contamination or burried drums of liquid solvents were discovered even though the pit was partially excavated and backfilled with clean fill.

Currently, two important land uses near the site are agricultural and residential development. Fields and orchards are located nearby in Longswamp Township, as well as in neighboring Hereford and District Townships. The site and the property in the immediate vicinity of the site is zoned as "R-2", which denotes a low density, residential district.

Groundwater contamination persists to this day, and is the major health threat at this site. The predominant organic contaminants at the site are 1,1,1-trichlorethane and 1,1-dichloroethene. These substances are used as indicators of other organic compounds at the site. The groundwater contamination does present a threat to drinking water at the site for residential wells downgradient from the contaminant plume.

The main recreational use of the land in Longswamp Township is fishing and hunting. The Berks Sand Pit area is drained by the headwaters of three creeks: West Branch of Perkiomen Creek, Perkiomen Creek and Swabia Creek. These creeks are all classified for cold water fishes and trout stocking. Ring-necked pheasants are the most abundant small game species in Berks County, while cottontail rabbits are the second most abundant. White-tailed deer also are plentiful. In addition to the hunting and fishing in Berks County, approximately four miles northeast of the site is the Doe Mountain skiing and Recreation Area in Lehigh County.

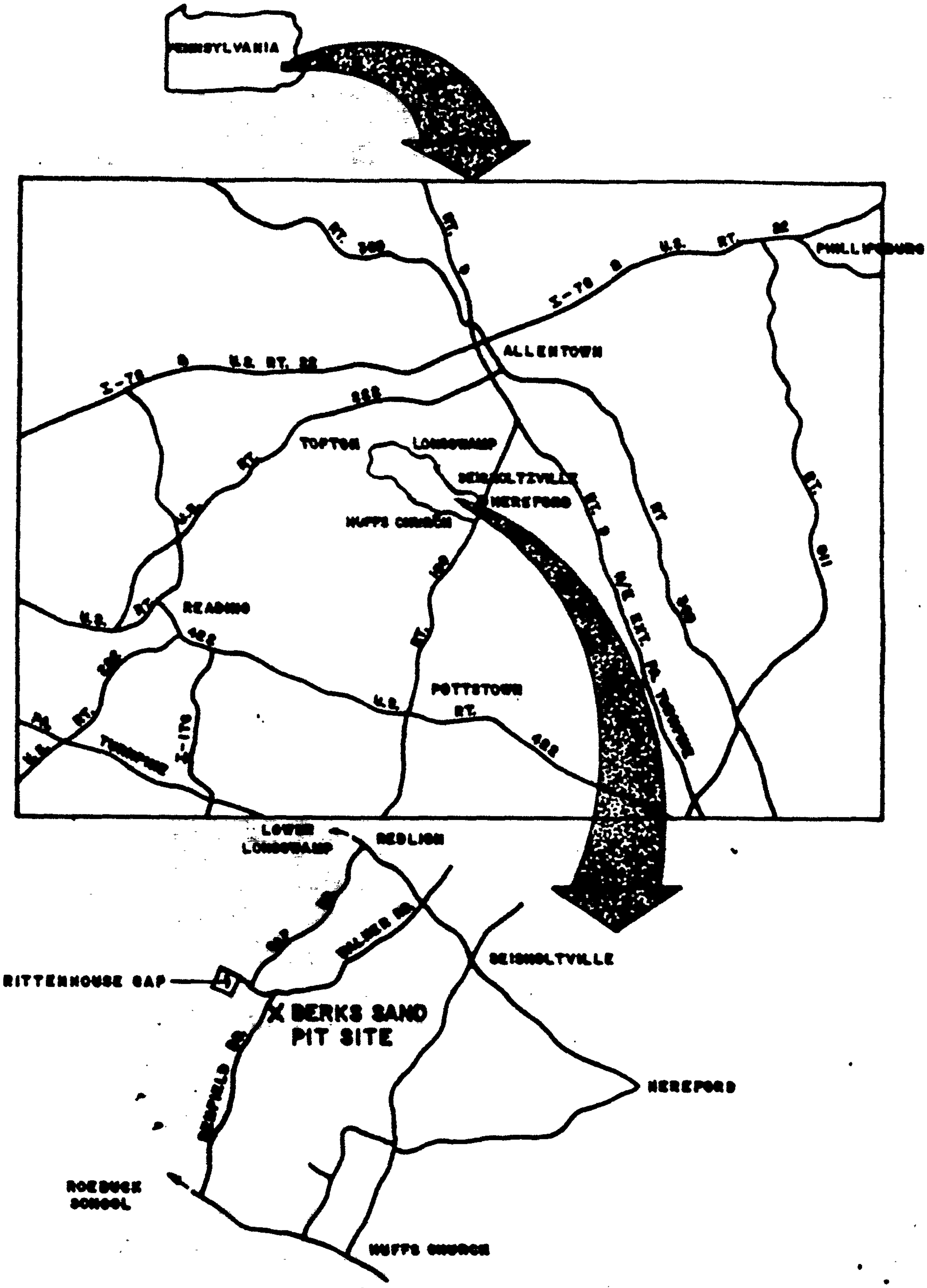


FIGURE 1

BERKS SAND PIT SITE
PROJECT LOCATION MAP

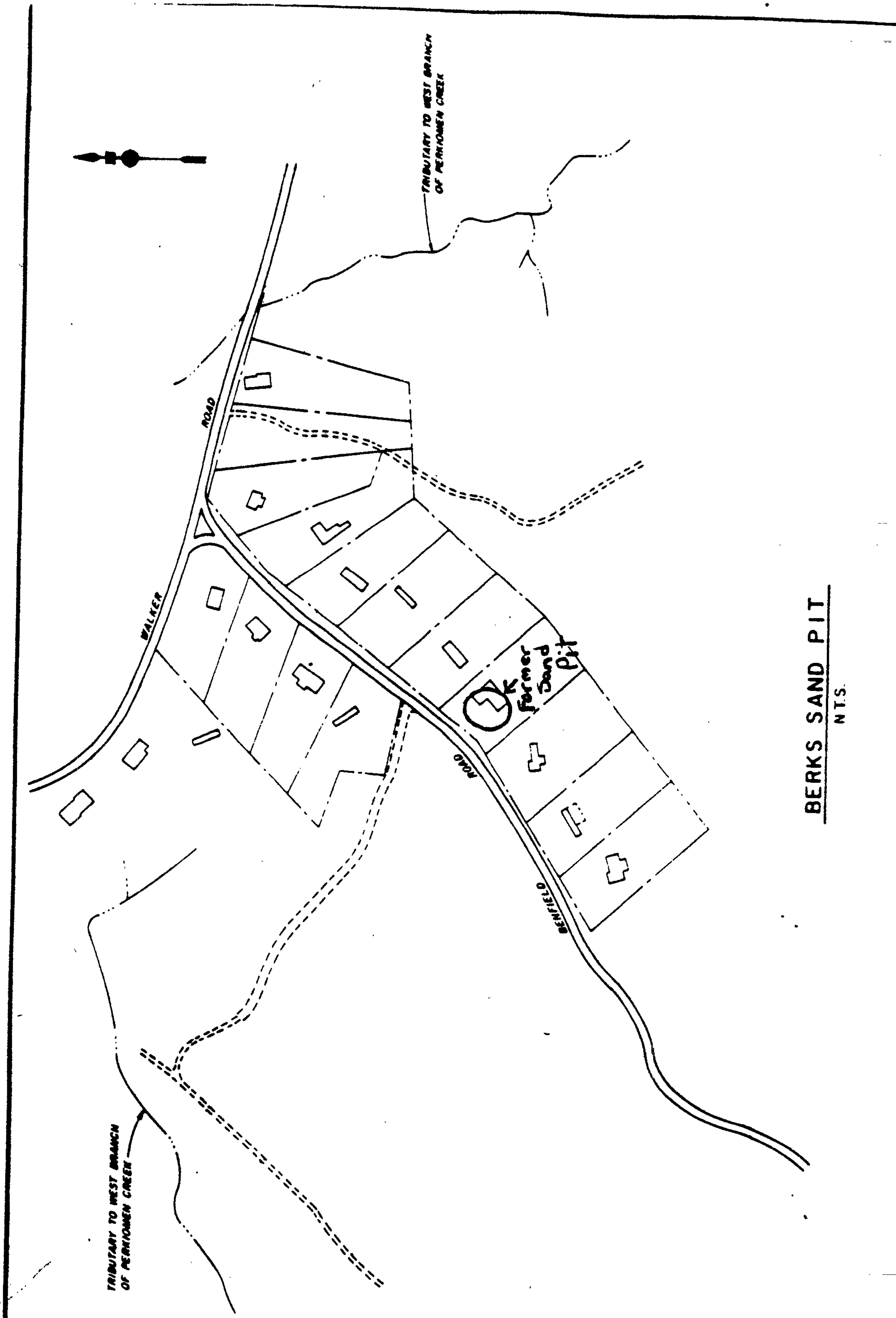

BERKS SAND PIT
N.T.S.
WALKER ROAD
BENFIELD ROAD
TRIBUTARY TO WEST BRANCH OF PERKIOMEN CREEK
TRIBUTARY TO WEST BRANCH OF PERKIOMEN CREEK
Former Sand Pit

Figure 2

Site History

Rittenhouse Gap, approximately one-fourth of a mile northwest of the site, has been extensively mined for magnetite iron ore and is believed to be one of the oldest ore-producing districts in Berks County. The now abandoned iron mines consisted of open cuts, tunnels, and shafts. The cuts generally are elongated northeastward. The Cha Gery mine shaft is located approximately 1,000 feet to the northwest of the site.

Residents reported tank trucks traveling Benfield Road between September and November 1981, and that shortly thereafter, in early 1982, their well water had a distinguishable odor and obnoxious taste. Laboratory analysis conducted by The Pennsylvania Department of Environmental Resources (PADER) in 1982 indicated that the following chemicals were detected in the residential well for the home built over the sand pit:

1,1,1-trichloroethane	> 45,000 ug/l
1,1-dichloroethene	> 800 ug/l
1,1-dichloroethane	> 300 ug/l
dichloromethane	> 300 ug/l
1,2-dichloroethane	> 150 ug/l
toluene	> 150 ug/l

The EPA conducted a removal action in the area of the pit during the summer of 1983. Activities consisted of excavating the area reported to be the sand pit and also installing a water supply well for use by four families whose wells were contaminated. The excavation did not encounter any buried drums or other objects relating to the contamination.

Remedial Investigation Summary

The Remedial Investigation (RI) gathered information through a site investigation of the groundwater, surface water, sediment and soil and the laboratory analysis of these materials. The purpose was to characterize the site to identify the level of contamination and the physical boundaries of the contaminated areas. The RI was conducted in 1987 and 1988 by PADER and its contractor Baker, TSA Inc. A copy of the RI report is contained in the Administrative Records for the site.

Onsite activities included air monitoring, surface and borehole geophysical surveys, pump tests, sampling of surface waters and local residential water supplies, subsurface soils, and groundwater from the newly installed monitoring wells. A second round of groundwater sampling and composite samples of RI-generated wastes were also taken. The sampling was performed to: 1) determine the aerial extent of contamination, 2) determine groundwater quality, 3) provide additional subsurface information, and 4) evaluate surface water and local well water quality offsite. Ancillary field activities employed for the RI included site surveying and mapping, in order to provide a current map of the site, and air monitoring to determine levels of respiratory protection requirements for the site. An outline of the activities conducted by the RI are highlighted below. The results of the RI are discussed in subsequent sections.

May 1987 - Site Reconnaissance

1. Air Quality Monitoring
2. Soil Gas Survey
3. Residential Wells

Fall 1987 - Groundwater Sampling Round

1. Air Quality Monitoring
2. Surface Water
3. Subsurface Soil Samples
4. Groundwater Monitoring Well Samples (Deep)

Winter 1988 - Second Sampling Round

1. Air Quality Monitoring
2. Surface Water
3. Groundwater Monitoring Well (Deep)
4. Groundwater Monitoring Well (Shallow)
5. Residential Wells
6. Water Supply Wells

Geology

The Berks Sand Pit is located in the Reading Prong Section of the New England Physiographic Province. Precambrain aged metamorphosed igneous, sedimentary and volcanic rocks comprise the highlands of the Reading Prong; the intermontane valleys are comprise of Cambro-Ordovician sediments consisting of limestone, dolomite, marble, and quartzite. Disseminated magnetite, and Cornwall-type magnetite deposits occur throughout the Reading Prong.

Magnetite ore is present near the surface west of the site, at the Cha Gery Mine, and north of the site, at Rittenhouse Gap. Magnetite rich pegmatites and massive magnetite was observed in three boreholes.

In the vicinity of the site the saprolite consists of a light brown, tan to orange clay with some silt and sand, and quartz and feldspar fragments. The saprolite changes to clay and sand with quartz and weathered granitic gneiss fragments at depth. Some local zones in the saprolite show evidence of foliation and relict structures.

The granitic gneiss is moderately to very closely fractured. Many fractures encountered in the boreholes contained chlorite filling and/or hematite staining on the fracture surfaces

Extensively weathered zones (possibly weathered fracture zones) were observed the maximum expected depth of significant fracture zones and weathered fractures, as determined from the cross-hole seismic velocity measurements, is approximately 150 to 200 feet below the ground surface.

The granitic gneiss is highly weathered throughout the area and the thickness of the weathered overburden is quite variable. There is, in general, no distinct boundary between the overburden and the weathered bedrock. Rather, there is a gradual change from saprolite to weathered granitic gneiss to fresh granitic gneiss.

Hydrology

Groundwater in the Berks Sand Pit area is encountered in both the soil overburden and in the bedrock. The bedrock, a granitic gneiss, has a low primary porosity and permeability but has a significant secondary porosity and permeability due to the presence of a complex fracture system.

In general, the fractures and fractured zones provide preferred avenues for groundwater movement; more specifically, highly weathered and altered fracture zones tend to provide preferred avenues for groundwater movement. Other avenues for groundwater movement as indicated by the borehole visual and geophysical logs include faults, mineralogical changes and grain size changes.

Two groundwater flow regimes have been identified at the site. A shallow flow regime occurs in the overburden and a deep flow regime occurs in the fractured bedrock. The shallow flow regime consists primarily of saprolite and highly weathered bedrock. Water in this shallow aquifer may occur as perched zones, generally above saprolitic layers, and under confined to semi-confined conditions, generally beneath saprolitic layers.

The amount of water that moves through the bedrock depends on the hydraulic gradient and the hydraulic conductivity of the fractures and their frequency of occurrence and orientation. The hydraulic conductivity of the fractures depends on such properties as dimension, interconnectedness, filling material, etc. These properties are quite variable and as a result, a highly complex flow field has developed at the site.

In general, there are a large number of interconnected fractures oriented in both a northeasterly and northwesterly direction. From plots of the extent of contamination it can be seen that the northeasterly flow direction is dominant.

Nature and Extent of Contamination

This section describes the types of contaminants found at the site and their distribution in the soil, surface sediment, surface water and groundwater. The most serious threat to public health and the environment identified is the introduction of organic solvents into the groundwater through the disposal of an unknown quantity of liquid wastes at the site. A second exposure pathway of concern is groundwater discharge to surface seeps and streams resulting in the contamination of surface water.

The result of the sampling performed during the RI showed four volatile organic compounds that pose a risk to human health and/or the environment. The four constituents that were identified as indicator parameters are:

* 1,1-dichloroethene
* 1,1-dichloroethane
* 1,1,1-trichloroethane
* tetrachloroethene

These chemicals pose the greatest potential public health risk at the site and were chosen because they represent the chemicals which were the most toxic, mobile and in the highest concentrations. The following sections describe the extent of these contaminants in the various media at the Berks Sand Pit Site.

Soil

Soil samples were taken during the drilling program from several borings. None of the four indicator parameters identified above were detected in the soils at the Berks Sand Pit Site. The maximum depth of soil sampling was less than 20 feet. No significant contamination was detected in the soils at the site.

Surface Sediments

Surface sediments were collected during November 1987. The sediments were collected to determine the possibility of chronic surface waste contamination. Ten of 28 samples collected showed some type of volatile or semi-volatile compound. The location of the surface sediment sampling points is given in Figure 3.

However, only one sediment sample, SP-2, showed detectable levels of 1,1-dichloroethane at 240 ug/kg. The occurrence of this compound in SP-2 indicates the possibility of chronic contamination of the seeps east of the former sand pit. The source of this contamination may be the accumulation of contaminants from the groundwater over the past several years. It should be noted that 1,1-dichloroethane is a possible degradation product of 1,1,1-trichloroethane. Surface sediment remediation is part of the recommended alternative.

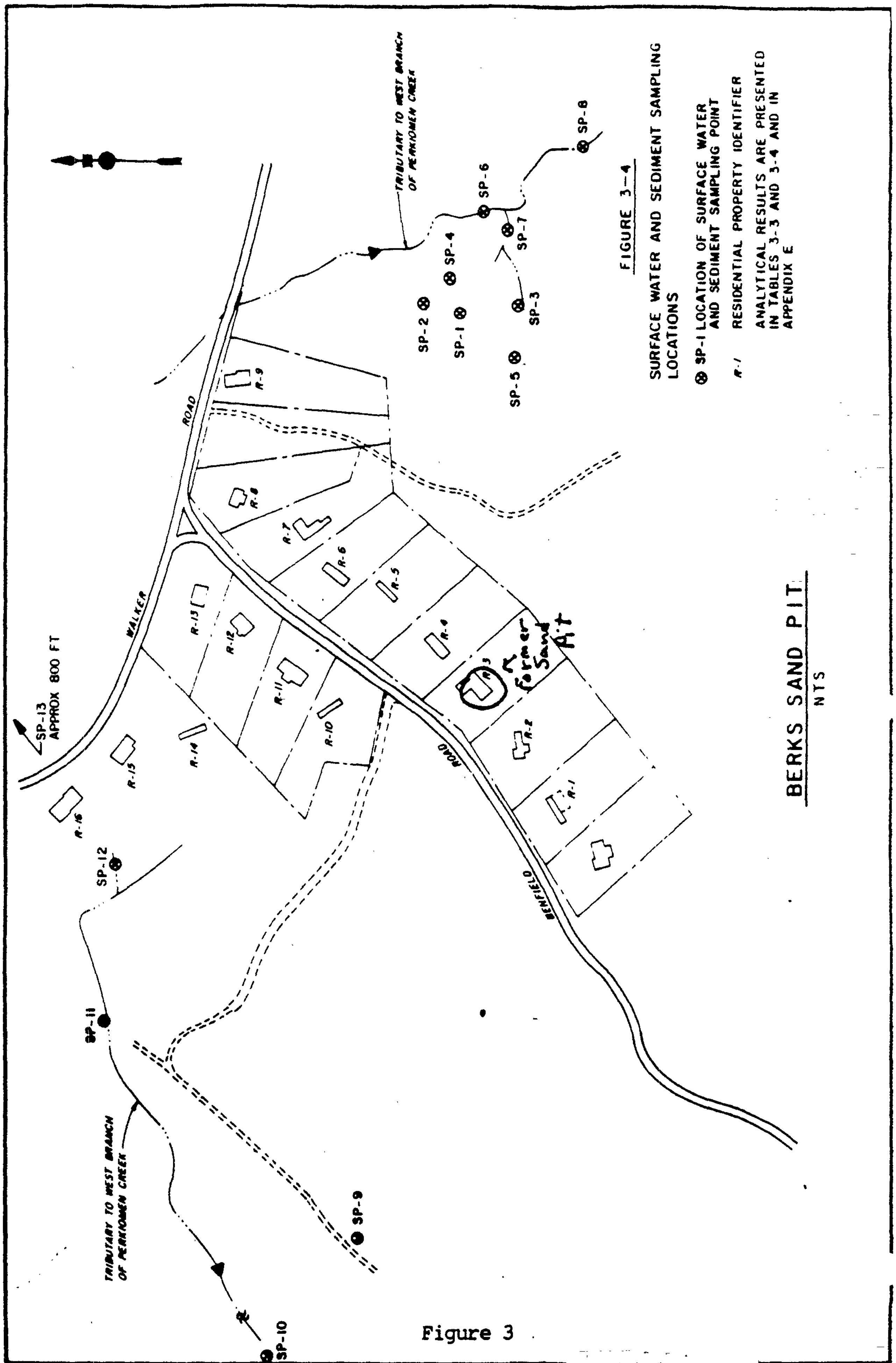

BERKS SAND PIT
NTS
FIGURE 3-4
SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS
SP-1 LOCATION OF SURFACE WATER AND SEDIMENT SAMPLING POINT
R-1 RESIDENTIAL PROPERTY IDENTIFIER
ANALYTICAL RESULTS ARE PRESENTED IN TABLES 3-3 AND 3-4 AND IN APPENDIX E
TRIBUTARY TO WEST BRANCH OF PERKIOMEN CREEK
WALKER ROAD
BENFIELD ROAD
SP-13 APPROX 800 FT
Former Sand Pit
SP-1
SP-2
SP-3
SP-4
SP-5
SP-6
SP-7
SP-8
SP-9
SP-10
SP-11
SP-12
R-1
R-2
R-3
R-4
R-5
R-6
R-7
R-8
R-9
R-10
R-11
R-12
R-13
R-14
R-15
R-16
TRIBUTARY TO WEST BRANCH OF PERKIOMEN CREEK

Figure 3

Surface Water

Surface water samples were collected at 12 sampling points in November, 1987 and at 13 sampling points in March, 1988. The locations of these sampling points are given in Figure 3. For both rounds, three of the four indicator parameters were detected: 1,1-dichloroethane, 1,1-dichloroethene, and 1,1,1-trichloroethane. These result are given in Table 1 . Some elevated metals also were encountered in samples SP-2 and SP-5.

The results of these analyses indicate that some contamination by 1,1-dichloroethene, 1,1-dichloroethane and 1,1,1-trichloroethane occurs in all of the surface water samples except SP-12 and SP-13. The highest levels of contamination are in the seeps east of the former sand pit (see Figure 3). This contamination is probably the result of the discharge of contaminated groundwater to surface waters. The downstream extent of the surface water contamination by volatile organic compounds has not been determined. Further sampling of the surface waters is part of the recommended decision. The detection of the elevated metals in SP-2 and SP-5 appears to be an isolated occurrence; the source of these metals has not been determined.

In summary, the surface waters northeast of the former sand pit exhibit the most significant contamination. The presence of volatile organic compounds (VOCs) in site surface water is believed to be related to localized discharge of contaminated shallow groundwaters. Groundwater remediation should prevent further discharge at these surface seeps. The metals are thought to be derived from scattered surface dumping of scrap metals which is prevalent in this area. The surface water west and northwest of the site show very low levels of VOCs.

TABLE 1
SUMMARY OF ANALYTICAL RESULTS FOR SURFACE WATER SAMPLES TAKEN IN NOVEMBER 1987

Chemical	SP-3	SP-4	SP-7
1,1-dichloroethene	19.00	38.00	17.00
1,1-dichloroethane	*	*	*
1,1,1-trichloroethane	64.00	120.00	62.00
tetrachloroethene	ND	ND	ND

ND - Not detected.
*Data did not pass QA/QC procedures.
All units in ug/l.

Note: All other surface water samples taken in November 1987 showed detectable levels of at least one of the four indicator parameters. However, the analytical results for these samples did not pass the QA/QC procedures. SP-13 was not sampled because it was frozen.

Groundwater

Groundwater samples were collected from May 1987 to March 1988. These samples can be divided into three categories: residential well samples, monitoring well samples and packer test samples. The residential wells were sampled in two rounds: November 1987 and January 1988 through March 1988. The packer test samples were taken in October 1987.

Thirty-eight constituents were detected in the groundwater: eight VOCs, six semi-volatile compounds (SVOCs) and 14 inorganics. Only the extent of the four primary indicator chemicals, 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, and tetrachloroethene will be discussed in detail since they exhibit the greatest risk to the community and the environment. No metals were detected above the National Primary Drinking Water Standards (NPDWS) in the groundwater.

Residential Well Samples

Two rounds of water samples were taken from the residential wells in May 1987 and in January 1988 through March 1988. The location of these wells are shown in Figure 4. Eleven residential wells were sampled during the first sampling round (May 1987). As shown in Table 2 five had detectable levels of at least one of the four indicator parameters. Only RW-4 was above the Maximum Containment Levels (MCLs) established by EPA for drinking water for both 1,1,1-trichloroethane and 1,1-dichloroethene.

Nineteen residential wells were sampled during the second round (January to March 1988). As shown in Table 3, six had detectable levels of at least one of the four indicator parameters. RW-2 exceeded the MCL for 1,1-dichloroethene and RW-3 exceeded the MCL for 1,1,1-trichloroethane. Five additional residential wells (RW-4, RW-5, RW-7, RW-9 and RW-10) showed detectable levels of at least one of the indicator parameters. However, data for these wells did not pass QA/QC procedures.

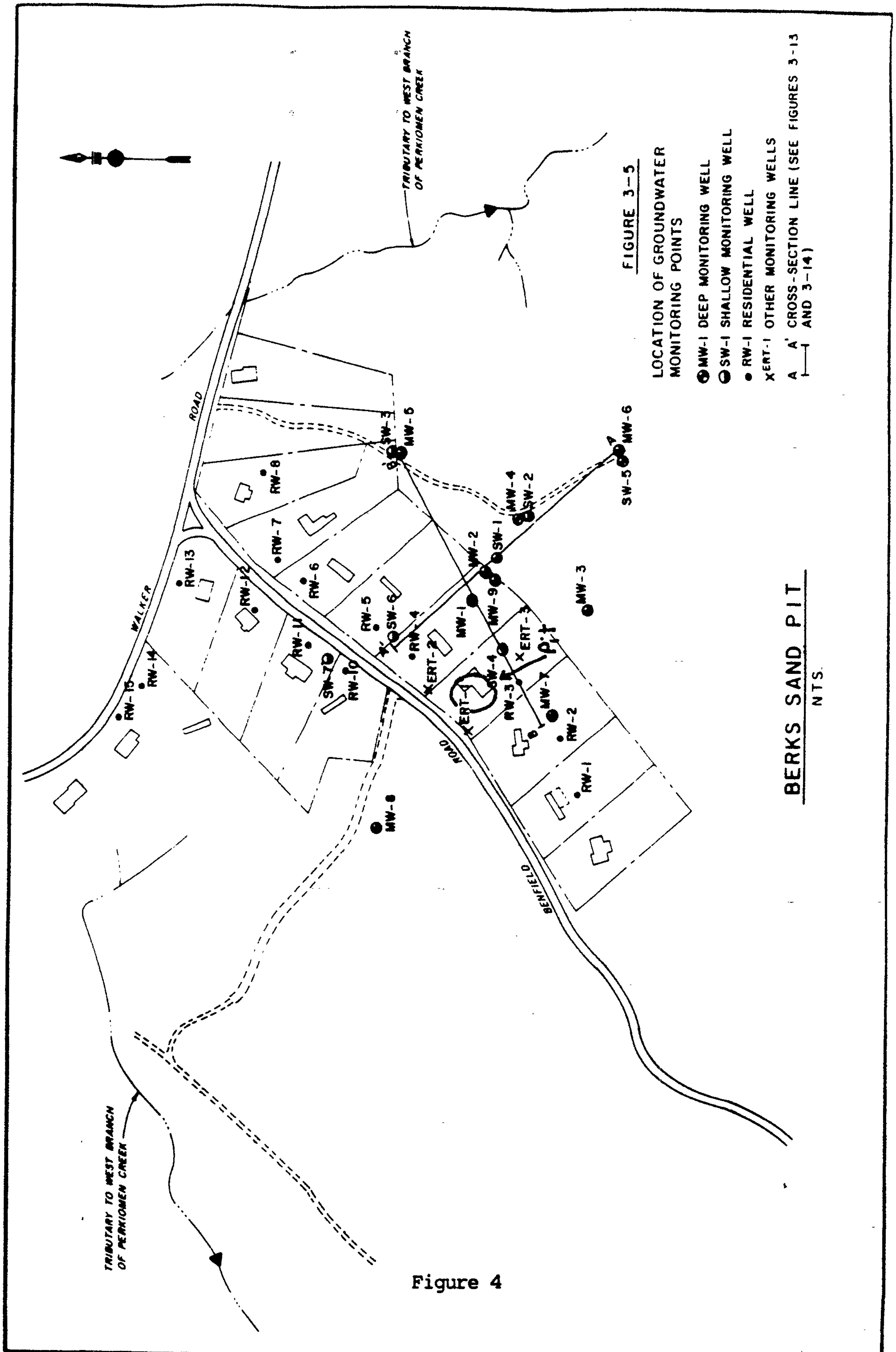


FIGURE 3-5
LOCATION OF GROUNDWATER MONITORING POINTS
MW-1 DEEP MONITORING WELL
SW-1 SHALLOW MONITORING WELL
RW-1 RESIDENTIAL WELL
ERT-1 OTHER MONITORING WELLS
A A' CROSS-SECTION LINE (SEE FIGURES 3-13 AND 3-14)
BERKS SAND PIT
NTS
TRIBUTARY TO WEST BRANCH OF PERKIOMEN CREEK
TRIBUTARY TO WEST BRANCH OF PERKIOMEN CREEK
WALKER
ROAD
BENFIELD
ROAD
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
SW-1
SW-2
SW-3
SW-4
SW-5
SW-6
SW-7
RW-1
RW-2
RW-3
RW-4
RW-5
RW-6
RW-7
RW-8
RW-10
RW-11
RW-12
RW-13
RW-14
RW-15
ERT-1
ERT-2
ERT-3
PIT

Figure 4

TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR RESIDENTIAL WELL SAMPLES TAKEN MAY 1987

Chemical	RW-4	RW-6	RW-7	RW-10	RW-11	MCL
1,1-dichloroethene	540	ND	ND	ND	ND	7
1,1-dichloroethane	ND	ND	ND	ND	ND	-
1,1,1-trichloroethene	6,800	13	21	12	27	200
Tetrachloroethene	ND	ND	ND	ND	ND	-

ND - Not detected.
All units in ug/l.
MCL - EPA's maximum contaminant level for drinking water

TABLE 3

SUMMARY OF ANALYTICAL RESULTS FOR RESIDENTIAL WELL SAMPLES TAKEN JANUARY 1988 THROUGH MARCH 1988

Chemical	RW-2	RW-3	RW-6	RW-8	RW-11	RW-12
1,1-dichloroethene	8.7	ND	*	ND	*	ND
1,1-dichloroethane	ND	ND	ND	ND	ND	ND
1,1,1-trichloroethane	47	1,400	16	6.5	21	6.1
Tetrachloroethene	*	ND	ND	ND	ND	ND

ND-Not detected.
*Data did not pass QA/QC procedures.
All units in ug/l.

Monitoring Wells

Three types of monitoring wells are located at the site. In 1983, the Emergency Response Team (ERT) installed three wells to collect groundwater samples. In the RI conducted by Baker/TSA, Inc., deep monitoring wells (MW) and shallow monitoring wells (SW) were also installed to further define the groundwater contamination plume. All locations are shown in Figure 4. The ERT wells were sampled in May 1987 and again in January 1988 through March 1988. The MW wells were sampled in November 1987 and again in February 1988 through March 1988. The SW wells were sampled in February 1988 through March 1988.

For the May 1987 sampling of the ERT wells, all three wells had detectable levels of 1,1,1-trichloroethane, as shown in Table 4. 1,1,1-trichloroethane also was detected for the January through March 1988 sampling round. Water samples from the 1988 sampling round also contained 1,1-dichloroethene and tetrachloroethene. These concentrations are shown in Table 4.

The MW monitoring wells were sampled in November 1987 and again in February 1988 through March 1988. The analytical results for the 1987 sampling round did not pass QA/QC procedures and will not be discussed here. For the February 1988 through March 1988 sampling round, at least one of the indicator parameters was detected in all of the MW wells as shown in Table 5. 1,1-dichloroethene was detected in all of the MW monitoring wells above the MCL of 7 ug/l. 1,1,1-trichloroethane was detected in MW-3 through MW-9 above the MCL of 200 ug/l. Additionally, tetrachloroethene was detected in MW-7 at a concentration of 25 ug/l.

The SW monitoring wells were sampled in February 1988 through March 1988. As shown in Table 6, wells SW-1 through SW-5 exceed the respective MCLs for 1,1-dichloroethene and 1,1,1-trichloroethane. The analytical results for SW-6 did not pass the QA/QC procedures.

Packer Tests

Water samples were taken during the packer tests in October 1987 to give an indication of the vertical extent of contamination. These samples were analyzed for both volatile and semivolatile organic compounds. Only one packer test sample passed the QA/QC procedures: MW-2 at the 44 to 54 foot depth. This sample showed a 1,1,1-trichloroethane concentration of 19 ug/l.

TABLE 4

SUMMARY OF ANALYTICAL RESULTS FOR ERT MONITORING WELL
SAMPLES TAKEN MAY 1987 AND JANUARY 1988 THROUGH MARCH 1988

Chemical	ERT-1 (1987)	ERT-2 (1987)	ERT-3 (1987)	ERT-1 (1988)	ERT-2 (1988)	ERT-3 (1988)	MCL
1,1-dichloroethene	ND	ND	*	250.00	*	250.00	7
1,1-dichloroethane	ND	ND	*	ND	ND	ND	-
1,1,1-trichloroethane	5.00	19.00	2,900.00	98.00	26.00	98.00	200
Tetrachloroethene	ND	ND	ND	ND	ND	6.40	-

ND - Not detected.
*Data did not pass QA/QC procedures.
All units in ug/l.
MCL - Maximum Contaminant Level.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR DEEP MONITORING WELL SAMPLES
TAKEN JANUARY THROUGH MARCH 1988

Chemical	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9
1,1-dichloroethene	48	48	860	3,500	120	340	1,300	41	1,100
1,1-di hloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1- richloroethane	180	90.00	2,200	7,300	300	940	3,700	*	3,100
Tetra loroethane	ND	ND	*	*	ND	ND	25.00	ND	*

ND - Not detected.
*Data did not pass QA/QC procedures.

AR300

TABLE 6

SUMMARY OF ANALYTICAL RESULTS FOR SHALLOW MONITORING WELL SAMPLES
TAKEN JANUARY THROUGH MARCH 1988

Chemical	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7
1,1-dichloroethene	850	220	100	270	280	*	ND
1,1-dichloroethane	ND	ND	ND	ND	ND	ND	ND
1,1,1-trichloroethane	1,900	6,500	240	490	600	*	ND
Tetrachloroethene	ND	*	ND	*	ND	ND	ND

ND - Not detected.
*Data did not pass QA/QC procedures.
All units in ug/l

A review of the historical data, as shown in the RI, indicates that although the contamination at the site has decreased somewhat over the past five years (1983 to 1988), it is still present in significant quantities. The decrease in concentration is probably best illustrated by the historical 1,1,1-trichloroethane concentrations recorded for RW-2, RW-3 and ERT-3. The data shows some large fluctuations in 1,1,1-trichloroethane concentrations over relatively short (months) periods of time. Some downgradient residential wells (RW-6, RW-7 and RW-11) also show slightly increasing 1,1,1-trichloroethane concentrations. These time-concentration relationships indicate that the contaminant plume (1,1,1trichloroethane) is migrating, dispersing and become more dilute with time. The remedial action selected in this Record of Decision address the groundwater contamination and the public health threat by extracting contaminated ground water and removing the organic chemicals and will prevent any further migration of the contaminant plume.

The contaminant plume is elongated in an east-northeasterly direction and is centered around MW-4 with a maximum concentration of 7,310 ug/l of 1,1,1-trichloroethane and 3,500 ug/l of 1,1-dichloroethene. Higher concentrations extend from the R-2 property as far as the tributary to the West Branch of Perkiomen Creek. Lower levels of contamination appear to extend north and northwest of the east-northeast plume axis towards Benfield and Walker Roads. The area of contamination, both high and low, potentially extends into residential properties R-2 through R-12. The contamination appears to have sunk and are being carried to deeper depths within the aquifer by vertical gradients. The maximum depth of contamination, based on the geophysical investigation and the packer tests, is thought to be 250 to 300 feet below the surface.

Public Health Evaluation and Environmental Concerns

The groundwater at the Berks Sand Pit Site has a significant potential adverse health impact on receptor populations. There were two complete exposure pathways identified in the RI. One pathway is the groundwater exposure via inhalation, ingestion, and dermal contact by receptors on residential wells, and the other is the surface water/sediment exposure pathway from the seepage of groundwater to the surface.

The air pathway is not a health hazard in regard to the volatilization of organics from the surface waters, from the surface soils or from the groundwater exposure pathway. In addition, the surface soils are not a health hazard from dermal contact or ingestion.

The groundwater exposure pathway had significant chronic health index values and projected risks values above the target risk values for carcinogens. The compounds most responsible for the potential adverse health impact were 1,1-dichloroethene and 1,1,1-trichloroethane.

The residential wells having levels of these two compounds of concern were RW-2, RW-3 and RW-4. The monitoring wells also showed concentrations capable of having a potential adverse health effect. The migration of the plume toward the northeast could bring the elevated concentrations found in the monitoring wells to human receptors.

The surface water and sediment exposure pathway is not a significant chronic health risk for human receptors but is directly in line with the migrating plume and further defines the extent of contamination. These surface water and sediments indicate a potential for the contaminants to affect aquatic life and the environment. Removal of the contaminated sediments and subsequent monitoring should help to determine the effectiveness of the groundwater extraction system.

Community Relations

The Community Relations Plan for this site was developed by the Pennsylvania Department of Environmental Resources and has been implemented over the past two years. All site related documents and the Administrative Record have been placed in the Longswamp Township Municipal Building. The public notice of EPA's proposed plan, which included the preferred remedial action alternative, was published on August 30, 1988. A thirty day public comment period began from that dated and ended on September 28,1988. A formal public meeting was held on September 12, 1988 at the Township Building to discuss the proposed plan. The transcript from that meeting represents the only comments received by EPA and PADER. All questions and comments presented at that meeting were addressed at that time. These are discussed in detail in the transcript which is attached.

In addition to the public participation in the remedy selection, local residents were continuously informed of the field activities and the occasions when residential wells were sampled.

Applicable, Relevant and Appropriate Requirements (ARARs)

The Remedial Action Alternative chosen for the Berks Sand Pit Site must meet all applicable or relevant and appropriate requirements (ARARs) in accordance with Section 121 of CERCLA, 42 U.S.C. Section 9621.

The primary regulatory considerations at the site apply to the treatment of groundwater. According to EPA's guidance for groundwater classification, this is a Class 1 aquifer which is currently in use. Therefore two contaminant specific levels for protection of human health must be met under the Safe Drinking Water Act (SDWA). 1,1,1-trichloroethane has a Maximum Contaminant Level (MCL) of 200 ug/l and 1,1-dichloroethene has an MCL of 7 ug/l (see 40 C.F.R. Section 141.12). These health based levels indicate the clean up standards for groundwater which the remedy must reach before clean up has been achieved. However, EPA and PADER will have to evaluate the effectiveness of the treatment system on a periodic basis to determine if these standards can be met or exceeded.

In addition to these contaminant level requirements, EPA and PADER must comply with all Federal Resource Conservation and Recovery Act (RCRA) requirements for onsite water treatment including air emissions site and offsite transportation, incineration and related air emissions. Also the State requirements would include the Pennsylvania Solid Waste Management Act (PSWMA), the Pennsylvania Clean Streams Law (PCSL), and the Pennsylvania Air Pollution Control Act (PAPCA). For the alternative proposing water discharge to surface streams the National Pollutant Discharge Elimination System (NPDES) requirements and PCSL must be met. Likewise for the proposals to reinject the treated groundwater, the Underground Injection Control (UIC) requirements must be met. The specific chemicals standards will be defined in the design specifications stage. Regulations for the selected remedial actions are further specified in the recommended alternative section.

Summary of Alternatives

Seven feasible Remedial Action Alternatives (RAAs) were developed to remedy the site conditions. The seven alternatives (RAA No. 1 through RRA No. 7) were developed to address four levels of cleanup as described below. A list of the seven alternatives and the cleanup categories they satisfy is provided below. A more detailed discussion of these RAAs contained in the Feasibility Study for the site.

Cleanup Category I: No Action

RAA No. 1 Continued monitoring of existing wells (groundwater) and surface water

RAA No. 2 Surface and groundwater monitoring, including the installation of additional monitoring wells

Cleanup Category II: Alternatives That Prevent A Risk Increase To Human Health

RAA No. 3 Surface and groundwater monitoring, including the installation of additional monitoring wells, and installation of an alternative water supply which will be defined in the design specification stage

Cleanup Category III: Alternatives That Meet Or Exceed ARARs for Human Health

RAA No. 4 Surface and groundwater monitoring, including the installation of additional monitoring wells, installation of an alternative water supply system which will be defined in the design specifications, groundwater extraction, groundwater treatment by air stripping with vapor phase carbon absorption, discharge of treated water to the watershed (stream), and excavation and disposal/treatment of contaminated sediments by landfarming or incineration

RAA No. 5 Surface and groundwater monitoring, including the installation of additional monitoring wells, installation of an alternative water supply system which will be defined in the design specifications, groundwater extraction, groundwater treatment by carbon adsorption, discharge of treated water to the watershed (stream), and excavation and disposal/treatment of contaminated sediments by landfarming or incineration

Cleanup Category IV: Alternatives That Meet Or Exceed ARARs For Human Health And The Environment

RAA No. 6 Surface and groundwater monitoring, including the installation of additional monitoring wells, installation of an alternative water supply system which will be defined in the design specifications, groundwater extraction, groundwater treatment by air stripping with vapor phase carbon absorption, discharge of treated water by reinjection into aquifer, excavation and disposal/treatment of contaminated sediments by landfarming or incineration

RAA No. 7 Surface and groundwater monitoring, including the installation of additional monitoring wells, installation of an alternate water supply system which will be defined in the design specifications, groundwater extraction, groundwater treatment by carbon adsorption, discharge of treated water by reinjection, excavation and disposal/treatment of contaminated sediments by landfarming or incineration

Table 7 provides a summary of the cost evaluation performed for the RAAs. All costs are presented in 1988 dollars.

Table 7
REMEDIAL ACTION ALTERNATIVES COST SUMMARY
BERKS SAND PIT SITE

RAA No.	Capital Cost ($1,000)	Annual O&M ($1,000)	Present Worth Cost ($1,000)
1	0	101.0	952.4
2	941.3	109.9	1,977.6
3	2,227.3	180.5	3,975.4
4	5,543.8	455.0	9,833.6
5	5,614.2	1,033.3	15,355.2
6	6,443.7	459.2	10,773.1
7	6,514.1	1,037.5	16,294.7

The following tables address the nine areas of concern which EPA considers for each RAA. Basically, there are two treatment alternatives (air stripping and carbon) and two disposal options (surface discharge and groundwater reinjection) for the water.

TABLE 8
BERKS SAND PIT
SUMMARY OF THE ALTERNATIVE EVALUATION

Alternative Number	ARAR Compliance	Toxicity, Mobility or Volume Reduction	Short-Term Effectiveness	Long-Term Acceptance and Performance
RAA 1 No Remedial Action	Does not comply with contaminant-specific ARARs	Does not reduce toxicity, mobility or volume	Does not reduce risks	Does not reduce risks
RAA 2 No Remedial Action with Groundwater Monitoring	Does not comply with contaminant specific ARARs	Does not reduce toxicity, mobility or volume	Does not reduce risks	Does not reduce risks
23 RAA 3 Alternative Water Supply with groundwater monitoring	Does not comply with contaminant-specific ARARs	Does not reduce toxicity, mobility or volume	Reduces only a portion of the health risks	Reduces only a portion of the health risks
RAA 4 (Air Stripping) ernative Water Supply, iment and Groundwater tment, Disposal to am	Complies with known ARARs	Volume reduced, mobility reduced, toxicity reduced	Reduces risks to public health	Reduces a majority of the risks
RAA 5 ernative Water Supply, Sediment and Groundwater Treatment, Carbon Adsorption, Stream Disposal	Complies with known ARARs	Volume reduced, Mobility reduced, Toxicity reduced	Reduces risks to public health	Reduces a majority of the risks

AR300653

BERKS SAND PIT
SUMMARY OF THE ALTERNATIVE EVALUATIONS

	Implementability	Community Acceptance	State Acceptance	Present Worth Cost	Protection of Human Health
1.	Easily implementable	Probably unacceptable	Probably unacceptable	952	Nonprotective
2.	Easily implementable	Probably unacceptable	Probably unacceptable	1,978	Nonprotective
3.	Easily implementable	Favorable acceptance	Favorable acceptance	3,975	Partially protective
4.	Implementable	Generally favorable acceptance	Favorable acceptance	9,834	Generally protective
	Implementable	Generally favorable acceptance	Favorable acceptance	15,355	Generally protective

BERKS SAND PIT
SUMMARY OF THE ALTERNATIVE EVALUATIONS

Alternative Number	ARAR Compliance	Toxicity, Mobility or Volume Reduction	Short-Term Effectiveness	Long-Term Acceptance and Performance
RAA 6 Alternate Water Supply, Sediment and Groundwater Treatment, Air Stripping, Reinjection	Complies with known ARARs	Volume reduced, Mobility reduced, Toxicity reduced	Reduces risks to public health and environment	Reduces most of the risks
RAA 7 Alternate Water Supply, Sediment and Groundwater Treatment, Carbon Adsorption, Reinjection	Complies with Known ARARs	Volume reduced, Mobility reduced, Toxicity reduced	Reduces risks to public health and environment	Reduces most of the risks

BERKS SAND PIT
SUMMARY OF THE ALTERNATIVE EVALUATIONS

	Implementability	Community Acceptance	State Acceptance	Present Worth cost ($1,000)	Protection of Human Health and Environment
6.	Implementable	Favorable	Favorable	10,773	Protective
7.	Implementable	Favorable acceptance	Favorable acceptance	16,294	Protective

Recommended Alternative

After extensive technical review and cost evaluation, EPA and PADER have selected RAA No. 6 as the appropriate remedial action for the Berks Sand Pit Site.

RAA No. 6 includes:

- excavation of contaminated sediments and offsite treatment and disposal by incineration
- installation and operation of a groundwater extraction system to remove contaminants from the aquifer
- construction and operation of an air stripper with vapor phase carbon absorption and the discharge of the treated water to the aquifer by injection wells
- construction of an alternate water supply system
- chemical and biological monitoring of the surface and groundwater quality
- restrictions to prevent any further drinking water wells in the contaminated areas of the aquifer

Groundwater remediation targets must meet or exceed the Maximum Contaminant Level (MCL) for both 1,1,1-trichloroethane (200 ug/l) and 1,1-dichloroethene (7 ug/l) as required by the Safe Drinking Water Act. The groundwater contamination levels will be reduced by the extraction, treatment and reinjection of clean water. The facility must meet hazardous waste requirements of RCRA Subtitle C 40 C.F.R. Part 264 and the Pennsylvania Solid Waste Management Act. This remediation may require up to thirty years of operation, but will be periodically evaluated to determine the effectiveness and technical feasibility of reducing groundwater contamination by this method. Based on this evaluation, the Agencies will determine to continue the extraction and treatment program or to cease treatment when the aquifer no longer presents a potential health risk.

Secondary target levels, which will be used as guidelines, to determine when the groundwater is no longer a risk are based on published Unit Cancer Risk (UCR) information. 1,1-dichloroethene is a possible human carcinogen and tetrachloroethelene is a probable human carcinogen. The secondary target will be to decrease the concentration of these contaminants to below 1.0 ug/l which would approximate detection limits by standard EPA analysis.

The groundwater will be treated to levels established by the Underground Injection Control (UIC) regulations 40 C.F.R. Parts 144,145,146 and 147.

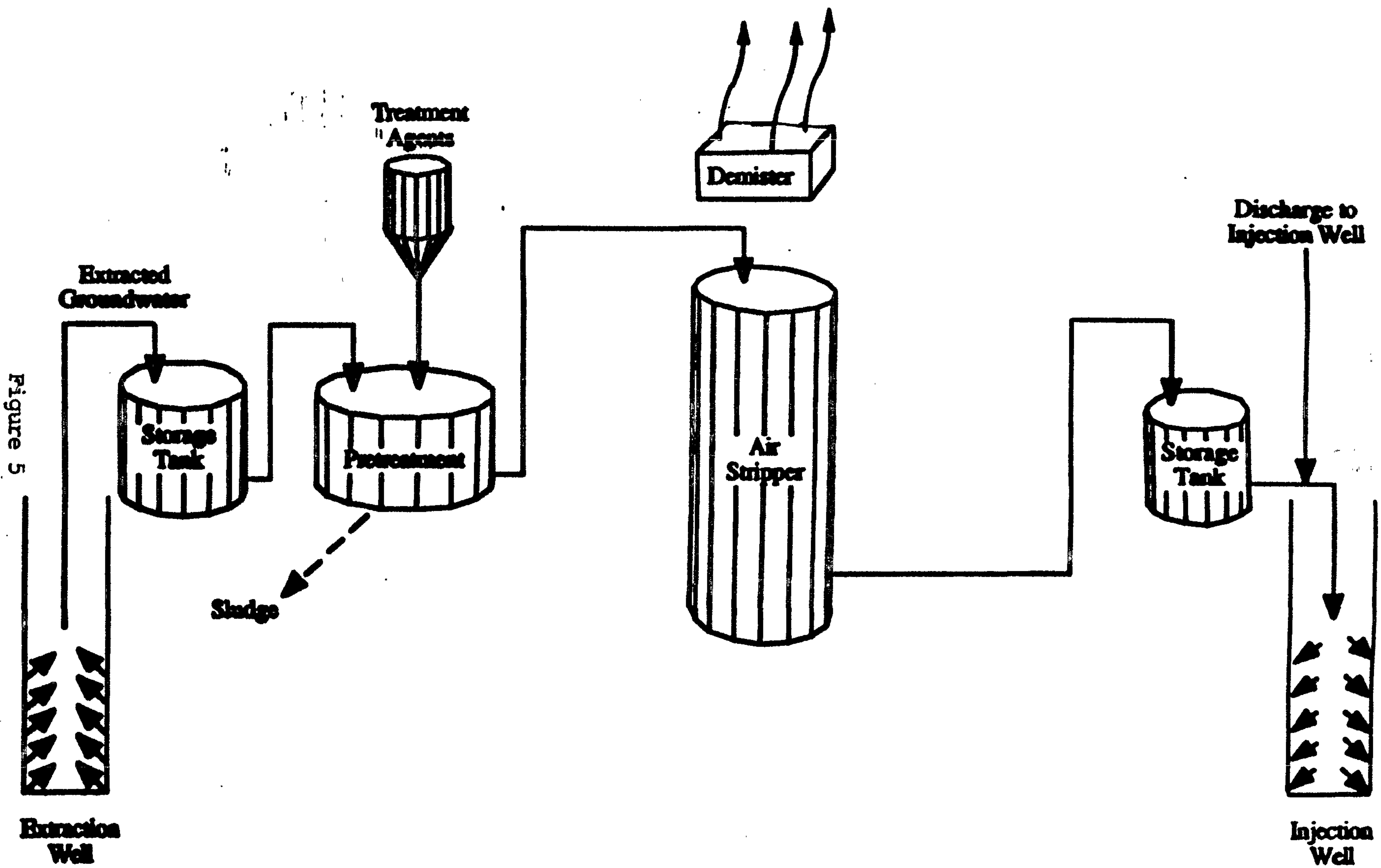
When a decision is made to discontinue the extraction and reinjection program a close out sequence will be initiated to decommission the wells and treatment facilities.

The alternative water supply source has not been resolved. Three options to be investigated in the design stage will include: extention of Mountain Village Community Water Supply, extention of Topton Public Supply, and a new well field with extention of the existing Longswamp Well Association. The local residents expressed a clear preference for the extention of the Topton Water Supply.

The contaminated sediments must also be excavated and sent to a permitted or interim status facility which is compliance with all hazardous waste requirements of RCRA Subtitle C 40 C.F.R. Part 264.

When comparing the remedial alternatives for this site, EPA was limited to RAAs 4, 5, 6 and 7 because these alternatives were the only ones which met ARARs. The Agency selected the air stripping treatment rather than the carbon absorption because they are equally effective at removing the groundwater contaminants and the air stripping is five million dollars less expensive than the carbon. Basically, replenishing the carbon is the major expense. The Agency also selected the reinjection alternative rather than surface water discharge because reinjection treatment requirements would be more stringent and reinjection may help to flush out the contaminated groundwater in a shorter period of time. Also there may be residences who would continue to use their private wells and reinjection would help to maintain the current level of the water table in the vicinity of the site. As shown in Table 8 the selected remedy reduces toxicity, mobility and volume of the contaminant plume by the extraction of the contaminated groundwater and treatment by air stripping. This alternative is protective of the public health and the environment and will provide a permanent remedy for the site.

Figure 5 shows the general process for RAA No. 6. Figure 6 shows the details of how an air stripper works and Figure 7 shows the new recovery and reinjection wells.



BERKS SAND PIT
GENERALIZED PROCESS DIAGRAM FOR RAA NO. 6

Figure 5

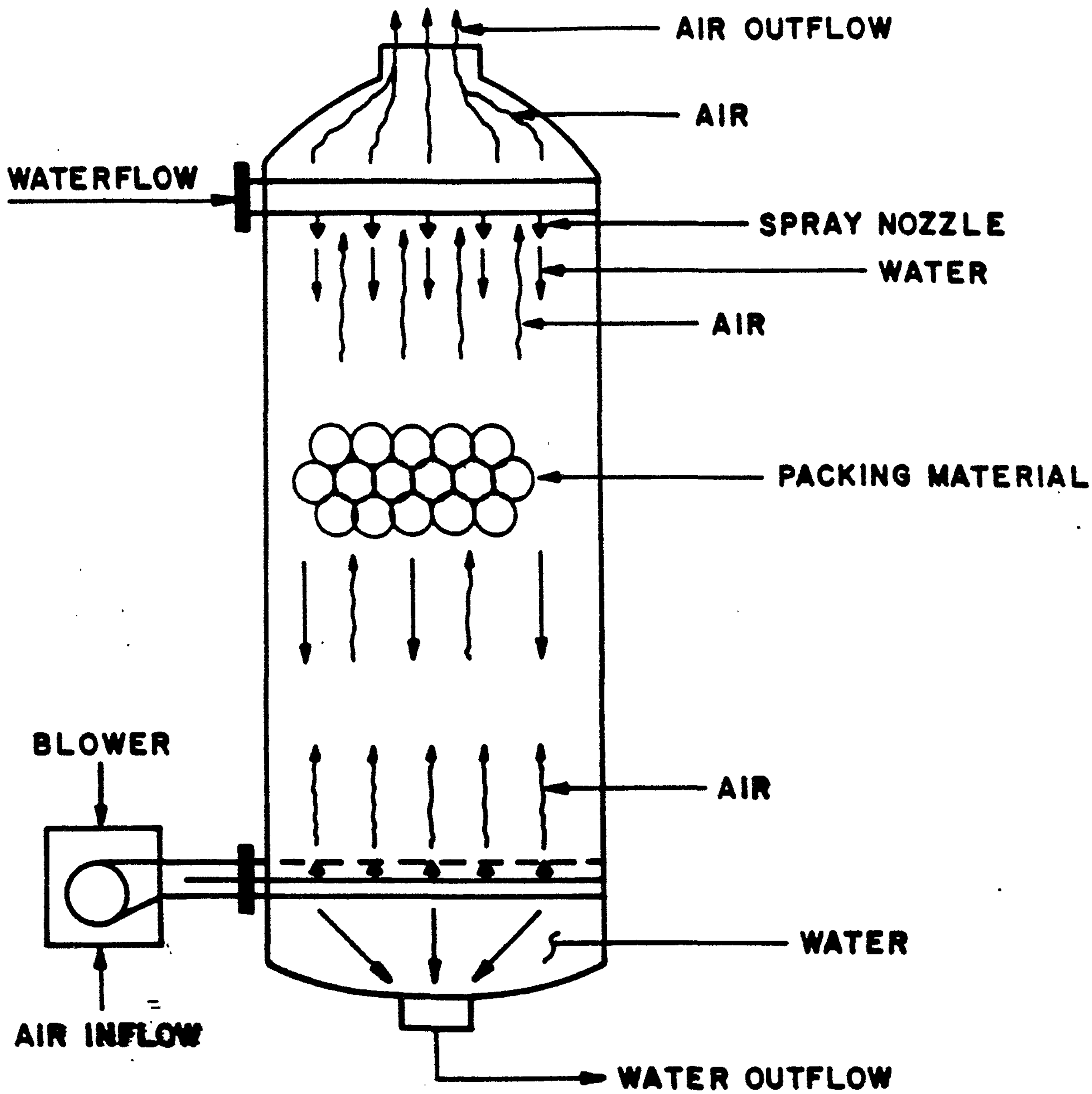


Figure 6

PACKED TOWER AIR STRIPPER

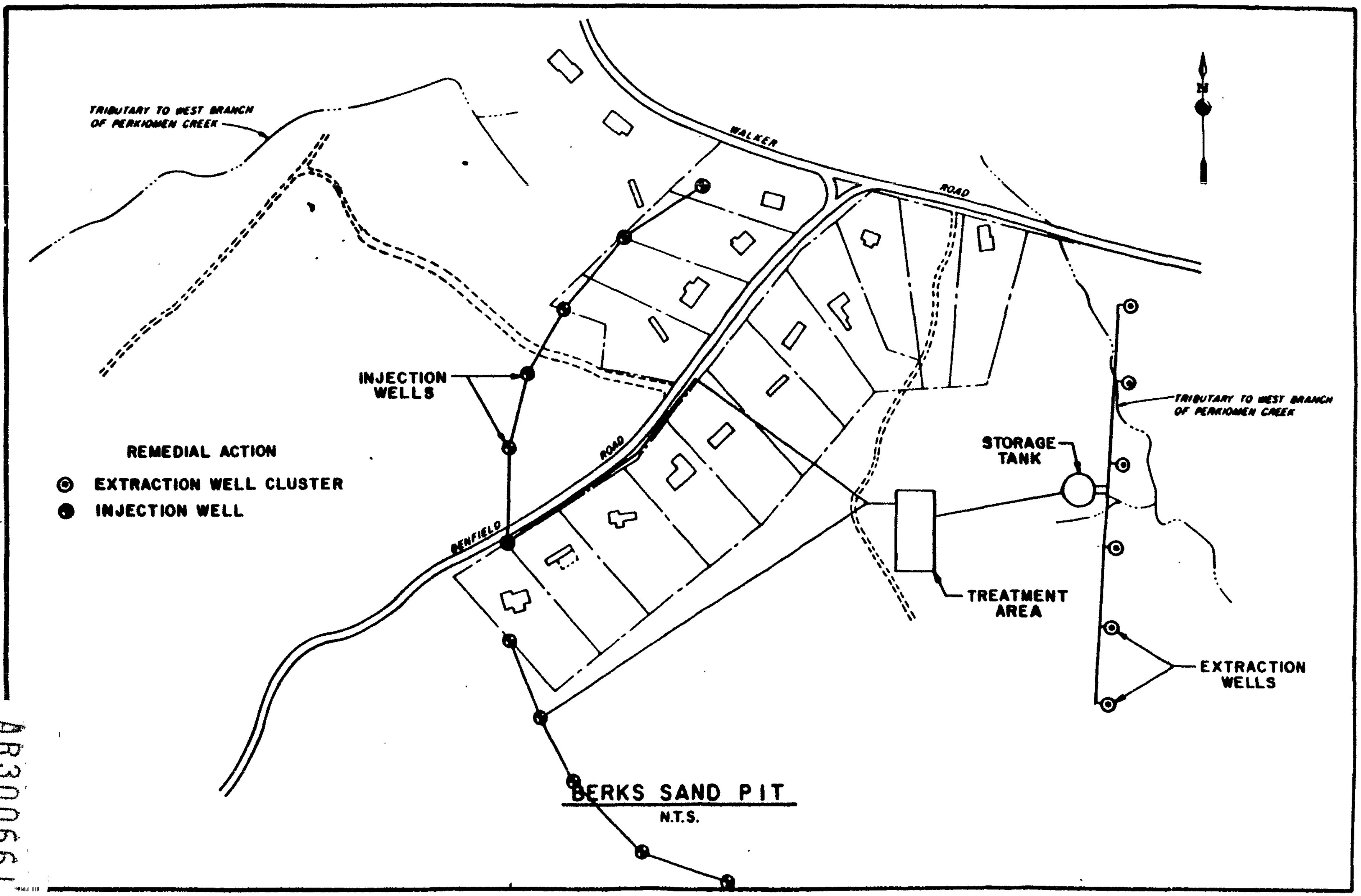


Figure 7

LOCATION OF EXTRACTION AND REINJECTION WELLS

Responsiveness Summary

The only response from the public during the comment period was obtained from the public meeting which was held September 7, 1988 and the minutes from the meeting are attached. To summarize, the citizens asked many questions about the remedy and the technical aspects of the differences between the air stripping technology and the carbon absorption method. We were able to show them some diagrams of the air stripper and described the approximate size and noise level of the system. The carbon absorption was compared to their own type of water softening system and they understood. We also explained that they were both effective in the treatment capabilities and that we chose the air stripping because the cost was five million dollars cheaper because we did not have the carbon to dispose or regenerate.

They were in agreement with the approach the Agencies had chosen to do groundwater remediation, but were somewhat concerned that the extraction and reinjection wells would not collect all the contaminated groundwater or that some of the reinjected water may cause further spread of the contaminant plume. We explained how the extraction and reinjection wells would have to be monitored, especially in the initial start up phases and that the treated water would have to be analyzed to be sure the contaminants were removed before the water could be reinjected. They did express concern about the frequency of our monitoring and we restated that beginning stages would have to be closely controlled.

When they asked about the source of the alternate water supply, we told them that it was not specified at this time and we mentioned that we would have to look into several alternatives. They immediately state, in unison, that they did not want to have the trailer park as the source of the water supply because they felt it would be used for personal gain rather that protection of their health. They expressed a clear preference to be hooked up to the Topton water supply which is approximately six miles away. They did not want to set up additional wells which they would have to maintain and operate under the current homeowners association because of the problem already encountered in operating the system which is currently supplying four residences.

Overall the citizens seemed to be in agreement with the proposed plan as presented and were happy to have their chance to ask questions and have an explanation.

PENNSYLVANIA
DER
Deputy Secretary for
Environmental Protection

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
Post Office Box 2063
Harrisburg, Pennsylvania 17120

September 29, 1988

(717) 787-5028

Stephen R. Wassersug, Director
Hazardous Waste Management Division
EPA Region III
841 Chestnut Building
Philadelphia, PA 19107

Re: Letter of Concurrence
Berks Sand Pit Superfund Site, Record of Decision (ROD)

Dear Mr. Wassersug:

The Record of Decision for the Berks Sand Pit Superfund site has been reviewed by the Department.

The selected final remedial action will include the following:

* Excavation of contaminated sediments and off-site treatment and disposal by incineration.

* Installation and operation of a groundwater extraction system to remove contaminants from the aquifer.

* Construction and operation of an air stripper with vapor phase carbon absorption and the discharge of the treated water to the aquifer by injection wells.

* Construction of an alternate water supply system.

* Chemical and biological monitoring of the surface and groundwater quality.

* Local restrictions to prevent any further drinking water wells in the contaminated areas of the aquifer.

I hereby concur with the EPA's proposed remedy with the following conditions:

* The Department will be given the opportunity to concur with decisions related to the design of the remedial actions to assure compliance with State design specific ARARs.

IN THE COMMONWEALTH COURT OF PENNSYLVANIA
COMMONWEALTH OF PENNSYLVANIA
LONGSWAMP TOWNSHIP
MERTZTOWN, PENNSYLVANIA

\- - - - - - - - - - - - - - - - x

In the Matter of:

PUBLIC HEARING
SUPERFUND PROGRAM PROPOSED
PLAN EPA REGION III
BERKS SAND PIT SITE
RECOMMENDATIONS OF THE
REMEDIAL INVESTIGATION
FEASIBILITY STUDY

\- - - - - - - - - - - - - - - - x

Transcript of Proceedings
Conference Room
Longswamp Township Municipal Building
Mertztown, Pennsylvania

Monday, September 12, 1988

7:02 p. m.

BEFORE: ROY SCHROCK, Hearing Chairman
Remedial Project Manager
EPA, Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

FRANK KOLLER
Community Relations Coordinator
Department of Environmental Resources
Fulton Building
Harrisburg, Pennsylvania 19401

THOMAS M. BIKSEY
Senior Environmental Scientist
Baker/TSA, Inc.
420 Rouser Road
Coraopolis, Pennsylvania 15108

WILLIAM D. TRIMBATH
Baker/TSA, Inc.
420 Rouser Road
Coraopolis, Pennsylvania 15108

APPEARANCES, Continued:

ART DALLA PIAZZA
State Project Officer
Department of Environmental Resources
Fulton Building
Harrisburg, Pennsylvania 19401

ALSO PRESENT

NEVIN BEHM
Township Supervisor

RUSSELL KULP
Township Supervisor

CONTENTS

ORIGINAL (Red)

EXHIBITS

PANEL	FOR IDENTIFICATION	IN EVIDENCE
[None]	--	--
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES		
[None]	--	--
EPA		
[None]	--	--
SPEAKERS		
[None]	--	--

P R O C E E D I N G S

CHAIRMAN SCHROCK: My name is Roy Schrock. And I'm with the United States Environmental Protection Agency.

EPA, in conjunction with the Department of Environmental Resources of Pennsylvania, conducted this study; basically provided the funds, that we could get started with this.

I'm going to try and introduce people. I'm not sure I have everybody's name down in my head very well.

But this is Art Dalla Piazza, who has been the main Project Officer with DER. And he's the one most of you are probably familiar with in one way or the other.

And his name appears in the documents on who to contact.

This is Frank Koller, also with DER. And he's in charge of the Community Relations, and helped us set all this stuff up and get everything in place so that we could provide the information.

Over here is Bill Trimbath, with a

consultant firm, which we call Baker Associates. And they were the people who were in charge of actually conducting the study, the ones who were out in the field collecting all the information.

And this is Tom Biksey, who is part of Baker Associates, and will be discussing some of the contaminants that we found there and just what they might mean.

He'll also be able to answer any further questions on what you folks might want to know on what's going to happen in relation to, you know, having these chemicals in the ground water.

This is, of course, our stenographer. We're required, really, to record all the information that is presented at this meeting, and actually have a transcript, which we will be able to review and attach to a document which we call the record of decision.

What we're actually doing here is leading up to the Agency's -- both EPA and DER, want to make a decision on how we're going to try and do our cleanup at this site.

And the purpose of this meeting is to present not only how we want to do our cleanup, but also to present the other alternatives we looked at, and to give you all an opportunity to come back and (ncd) comment on what we're trying to propose, and maybe suggest some ideas of your own that we might be able to incorporate into the Agency's final decision.

So, with that, just one more thing. There is a sign-in sheet in back, I believe, someplace, just so we have a record of who's here.

how, the only other thing I want to mention right now is that we did put out these documents, which are up here in front.

But they've been placed in this office, here. And one of the documents which is really the smaller version that tells what we have in mind is called a proposed plan.

So if you haven't had a chance to look at that yet and you want to spend some more time, I would encourage you to ask for that copy of the proposed plan, which will give you a five to ten-page summary of what it is we're proposing to do.

And it will also have a glossary at the end which explains what some of the words are. Because I know there's a lot of terms that we don't really use in normal conversation.

So, Art, if you have nothing to say

ORIGINAL (Red)

right now, I'd like to turn this over to Bill Trimbath, who will present some of the findings of the actual study, and how we conducted ourselves in the field.

Then, we'll just sort of pass through as we go down.

MR. TRIMBATH: Good evening. As Roy mentioned, my name is Bill Trimbath.

And it was my responsibility to head the efforts of our engineering firm to go out on the site and collect the information to complete what we call the remedial investigation.

What that really is is an effort to go out to the site, obtain as much information as we can of the chemicals and the geology, air, the ground water, the surface water, and in the soil.

We take the results of that and prepare one of the bound reports we have on the front table called a remedial investigation.

That gives us the information that we need to go on through the feasibility study and up through the record of decision.

Briefly, we conducted our work beginning in May of 1987. We came on site, conducted initial site reconnaisance to take some water samples, basically, from the residential wells (Red) and from surface sampling points, which we show here, [indicating].

And these are brought out in a little bit more detail in the remedial investigation. We follow that up with another investigation, benefiting from what we obtained here, to go through with our program to monitor the ground water.

And you might have seen some drilling rigs in the area brought up from the area through the fall of '87 and on through the winter of '88.

What we were attempting to do was to install monitoring wells that would obtain information on the quality of the ground water in the shallow zone between zero to ninety feet, and to a deeper zone between ninety to a hundred and fifty feet.

The samples that we obtained were taken to a laboratory, analyzed in accordance with EPA procedures.

And the results were reported to us. Okay. As the result of looking through some old information, and talking with some people, we knew that the contaminants, the material was in the ground water.

So, therefore, adding to the existing monitoring well, the existing residential wells being used for drinking water, we augmented that by placing in some monitoring wells.

We installed twelve deep monitoring wells, and nine shallow monitoring wells, in the area that we believed the contaminants were most likely to be encountered.

As a result of the water analysis over the three different time periods, we encountered four contaminants of concern, that showed up most predominately in the ground water and the surface water samples.

The names right now may not be that important. But what these -- all four chemicals are are solvents.

They're materials used to clean metallic parts of grease and other type of soil. They all react relatively the same.

They're slightly insoluble in water. Therefore, they do not mix in water. And when they're added to the environment, they tend to make their way through the soil, and to deposit in the fractured bedrock that we find beneath the site.

So these four contaminants -- and

ORIGINAL (Red)

these are just their abbreviation, DCE, DCA, and TCA, with the tetrachloroethane, were the contaminants found on site.

Most -- more predominately was the TCA and the DCE. Again, that was the result of the laboratory analysis that was conducted on the ground water and surface water samples.

Using those results, we were able to generate an outline of the groundwater plume, based on the results from the groundwater monitoring results.

And let me just center this just a little bit better. We mentioned before that this material, added to water, tends to drop.

It does not tend to surface. It tends to drop. And what we tried to construct are areas of concentration.

And, for example, this is an area of concentration for the TCA, one of the solvents. And what this shows is the level of concentration, ranging from about 6,000 parts per billion, down to trace levels, which are just those levels detectable at laboratory, in the shallow groundwater system.

What we found was that the polluted ground water was moving away from the homes in the easterly and northeasterly direction.

I mention that this is between zero and ninety feet from the surface. We also saw that the groundwater sampling points, where it was exiting at the surface in the form of springs and seeps, were in five locations along this branch of a stream.

We also encountered contaminated material at those five points. I mention, again, this is between zero to ninety feet.

And it's making its way to the east and to the northeast. And that was for one of the solvents, TCA.

We were able to estimate to the same extent for the other solvent, DCE. And this is also in the shallow ground water, between zero to ninety feet deep.

See, here the concentrations are a little bit different from a high of about 800 parts per billion, down to a trace amount, where that is barely detectable in the laboratory.

And, again, it is moving off towards the east to northeast. We mentioned that we found two levels of groundwater movement, both in the shallow water and the deep water.

The deeper zone was between ninety to a hundred and fifty foot deep. And what we found here was that the DCA, the material that we talked about before, was found in a higher concentration, but a lower level.

Remember, I mentioned this material does not mix with water. And it tends to drop. Therefore, when we saw that we had a higher concentration here, [indicating], up to about 7,000 parts per billion.

That was in accordance with what our belief, how this material would act with the water. Again, it ranged from 7,000 parts per billion to trace levels at those monitoring points here, [indicating].

And you can, again, see, it's moving towards the east and to the northeast. We are also able to generate a graph.

I mean -- pardon me -- a chart, for the other solvent, the DCA. Again, you will notice that the concentration here is a little higher.

Because it's deeper, going from 3,000 parts per billion, down to trace levels through here.

If it's easier to see, this shaded

ORIGINAL (Red)

area on this portion over here, [indicating], is relatively -- the same as we're showing up in here, [indicating].

And what that is is what we call the area of the contaminated ground water, based upon the results of what we have from the laboratory.

We did not encounter contaminated material in the soil located at the surface. We did not encounter contaminated air during our air monitoring.

The extent of the contaminants that we found were generally within this area, [indicating].

And, again, they were moving off towards the east.

Does anyone have any questions?

MR. GRUVER: May we have copies of these test results? My name is Karl S. Gruver, G-r-u-v-e-r; Karl with a "K."

Where -- may we have copies of these test results?

MR. TRIMBATH: Okay.

MR. GRUVER: Specifically, for my property. I've received two -- three different times samples were taken.

ORIGINAL (Red)

Once they simply lost them. The other two times for the well water, theoretically, I received copy of this week.

For the spring, which is your TP -- test point twelve, I have not received any. There was at least two samples taken from that point.

Also, TP eleven, which is Ann Ecks. She -- I was talking to her immediately prior to coming.

She was not able to come this evening. She would like results of that, as well.

MR. TRIMBATH: Okay. I think you'll be able to find all of our results that were taken over all the sampling occasions in the appendix, which is volume two of the investigation.

MR. GRUVER: Do you have copies that I might retain?

MR. TRIMBATH: We have a copy up here. If you would like a copy, speak with Art Dalla Piazza, to --

MR. GRUVER: I've already requested copies since the first initial testing from this gentleman.

That's why I'm requesting it from you, currently.

ORIGINAL (Red)

CHAIRMAN SCHROCK: We can go through this and make copies for you.

MR. GRUVER: Thank you. I'd really appreciate that.

MR. DALLA PIAZZA: The test results are being prepared and will be sent out.

We were in quite a rush here preparing for the final presentation. And Baker was only able to give the final results to us just a couple of weeks before the presentation occurred.

MR. GRUVER: Well, the initial test was at least ten months ago. I'm sorry to rush you.

MR. TRIMBATH: Well, that's true. The tests were ten months ago. Before we can report the results as we did in the report, there's a very extensive amount of Q/A Q/C that has to be performed.

The analysis --

MR. GRUVER: That March report I haven't gotten from last year.

MR. TRIMBATH: Well, I'm not sure of that. You'll have to check with Art. But it does take some time to go through them, and validate the information before it's reported.

There are some very stringent

ORIGINAL (Red)

reporting requirements that are met that are standard throughout the program.

And those are also followed here. And they're followed so that the information that you do see is reported correctly.

CHAIRMAN SCHROCK: We can make sure you get that.

MR. TRIMBATH: Yes, Ma'am.

MS. YANNONE: My name is Judith Yannone. I have a question concerning these slides that you're showing us with the scope of contamination now, are these the most recent water tests, like the ones we just got results of this week?

MR. TRIMBATH: Yes, Ma'am.

MS. YANNONE: Okay.

MR. TRIMBATH: That's included in there. And I'd like to make the point, the material is moving.

But this is based on the latest information. This is not what we feel to be a stagnant system, that is just sitting there; that it is moving off towards the east.

And we are seeing instances where that material is surfacing. There's a number of seeps through here, [indicating].

And they're starting to surface at those seeps.

MS. YANNONE: So the contaminated -- originally, we had -- now, this is, what, three years ago?

We thought it was going the opposite way.

MR. TRIMBATH: Up towards here, [indicating]?

MS. YANNONE: Yes.

MR. TRIMBATH: Well, what we did is that not only did we base this on looking at the results themselves.

We also conducted a geophysical test, which is the method to select or -- or to map the trend of the fractures.

This rock is very highly fractured. It's very irregularly fractured. You've probably seen that from the mines in the area.

One thing we found is that there are a series of old mine openings down along this access road.

We also found through our study and doing some more field work, that there are a number of major fractures trending towards the east to the northeast.

And so, based on the results that we have over here, we didn't see that migration in this direction, [indicating].

We saw it in that direction, [indicating].

If there's any other questions, you can ask me now, or after the meeting's over. What I'd like now to do is introduce Tom Biksey from our firm.

And Tom will give you some information on the fate and nature of the contaminants, and how they relate to human health and the environmental habitat.

MS. YANNONE: Okay.

MR. TRIMBATH: Thank you very much.

MS. YANNONE: Okay.

MR. TRIMBATH: Mr. Biksey.

MR. BIKSEY: Okay. What I'd like to talk about now is the levels that Bill talked about that were found both in the residential wells and in the ground water of, primarily, these two solvents, [indicating], these two contaminants, the 1, 1 - dichloroethene, and the 1, 1, 1 - trichloroethane.

These two chemicals are the ones we believe are the highest risk chemicals, that would present the greatest amount of problems.

ORIGINAL (Red)

You could see that as you saw on the diagrams Bill put up that the maximum level of 1, 1, 1 - trichloroethane was 6,800 parts per billion, with an average of 707.

The 1, 1, dichloroethane, the maximum was 540, with an average of 190. You can remember that the dichloroethane, or DCE, was at a lower concentration, realative to the 1, 1, 1 - trichloroethane.

These two numbers here represent the MCLs, or maximum contaminant levels. These are the maximum allowable levels EPA has established to -- to assess the water as safe for public drinking.

You can see that these levels we found in the residential wells, [indicating], are well over these levels, [indicating], established by EPA; clearly, showing that the -- the ground water is contaminated.

If you take all the ground water together -- this would be including the monitoring wells that Bill talked about, and the residential wells -- you can see that we even have higher levels; the 7,300 maximum for 1, 1, 1 - trichloroethane, and 1,226 parts per billion average for 1, 1, 1 - trichloroethane.

Okay? This is showing not only that the levels are higher in the ground water, but helps to establish that the plume is moving in this direction, here, [indicating], as these wells showed the highest levels.

You can see the same pattern for the 1, 1, dichloroethane right here, [indicating], with 3,500 for a maximum, and 534 for the average.

And, again, you can see these are well above the EPA criteria, representing safe drinking water.

Now, what we feel is occurring is the plume is moving in this direction, [indicating]. And right now we have -- these residential wells are contaminated above the levels that are acceptable by the EPA, the MCLs.

And it's our concern that the plume will continue to migrate. And that is the focus of the remedial alternative, is to treat this water, to bring it back down to levels that are below the MCL, which would represent safe drinking water.

And that's about all I have to say

for now. Are there any questions?

MS. VAN ELSWYCK: My name is Joyce Van Elswyck. Are those the only chemicals you tested for, those four?

MR. BIKSEY: No. We tested for a number of chemicals.

MS. VAN ELSWYCK: Because the reason I ask is my first initial test done a couple years ago showed up, like, thirty-five different chemicals.

And the trichloroethane came up in like a hundred fifty thousand parts per billion.

MR. BIKSEY: Yes.

MS. VAN ELSWYCK: And now it's dropped to like 1,400, which -- and that seems to be the only harmful chemical that's showing up right now, which seems sort of amazing.

Unless it's due to the level at which you tested the water, because it is heavier than water.

Because you didn't go down deep, and were not using --

MR. BIKSEY: Well, no. We do test for all the chemicals. But through a selection process, as part of the public health evaluation, you evaluate all of the other different chemicals, and find out what chemicals are, perhaps, above MCLs, what chemicals occur repeatedly throughout the different samples in the ground water samples.

And these are the chemicals we feel are representing the greatest adverse potential health effect.

Because they're found at high levels for much of the samples.

MS. VAN ELSWYCK: Well, what made the levels drop so severely?

MR. TRIMBATH: Bill, if I could answer that?

MR. BIKSEY: Yes.

MR. TRIMBATH: What we noticed as the ground water moved was it just naturally dilutes itself.

MS. VAN ELSWYCK: Um hmm.

MR. TRIMBATH: The concentration becomes less and less. We compared our results with what we found that were the results that were taken over three years ago.

And we saw in many cases a marked decrease in the level of contamination from these solvents than what was --

ORIGINAL (Red)

MS. VAN ELSWYCK: Okay.

MR. TRIMBATH: Samples taken back in, I believe, '83 and '85.

MS. VAN ELSWYCK: Then, as it -- as it migrates, it's going to dilute itself. Why go through all the cleanup?

MR. BIKSEY: Well, because at its present levels -- level, it's still presenting a risk.

It's still presenting an adverse health effect. Whereas, before you had, perhaps, this area here, [indicating], very highly contaminated.

MS. VAN ELSWYCK: Right.

MR. BIKSEY: A very big pool of high concentrated polluted water. Now, you have through the dilution process, the plume is migrating this way, [indicating].

But still at this level right here, [indicating], and as it moves toward, perhaps, other residents or further down the line, it will still be at levels which could potentially cause an adverse health effect.

So I guess if it's at a hundred parts per billion, or 500 parts per billion, it's still --

it's still polluted.

ORIGINAL (Red)

And it's still above the EPA criteria. And it's still considered unhealthy to drink.

So, whereas it is diluting, and spreading out, it -- it's going -- the potential at the front of the plume where it's migrating to, have a potential adverse health effect.

CHAIRMAN SCHROCK: Let me add one more thing to that. EPA is required to comply with all of EPA's regulations.

MS. VAN ELSWYCK: Um hmm.

CHAIRMAN SCHROCK: And this is clearly a potential source of water that could be used in the future.

Right now it's contaminated. But the goal for EPA would be to clean it up to the point where it might return to be a potential source of water to the people who would need drinking water.

MS. VAN ELSWYCK: Okay. So, in other words, what your -- what your goal is, is to -- is it to prevent it from migrating?

Or is it to clean up what's there?

MR. TRIMBATH: Both.

CHAIRMAN SCHROCK: Both.

MR. TRIMBATH: By pumping the water and treating it, you'll prevent its migration and clean it.

CHAIRMAN SCHROCK: And EPA has set those MCLs as requirements for any drinking water. Therefore, we must try and attain those levels, or lower.

So --

MS. VAN ELSWYCK: Well, they go up every year.

CHAIRMAN SCHROCK: The numbers do change. Sometimes they go down drastically, too. And I think if you ever have the time to go through the documents, we did show about forty different contaminants total that showed up.

But, again, we really have to limit to those that are more of a concern for health and the environment.

MR. GRUVER: Who makes those choices?

CHAIRMAN SCHROCK: Which ones we are concerned about?

MR. GRUVER: Right.

CHAIRMAN SCHROCK: We follow the EPA guidance for those that have health risk factors and those that are not at health risk factors.

MR. GRUVER: Okay.

CHAIRMAN SCHROCK: Basically, the research has been done on some of these. If they have any kind of cancer potential, they're clearly going to be one that we're going to worry about the risk.

MS. VAN ELSWYCK: But what about the other health risks? The ones that do liver and heart damage.

You also consider those?

CHAIRMAN SCHROCK: Some of them are on the list that we would be considering. Yes. But, again, we -- we go back to what EPA or DER has set as the standards for safe drinking water.

MS. VAN ELSWYCK: Um hmm.

CHAIRMAN SCHROCK: And that's where the basic list originates from. There are some metals in there that we're concerned about.

Because the metals would possibly have an effect on the fish and wildlife. So we've got that other bit of concern.

What's entering the -- the surface seeps and into the streams, may eventually be getting down into, you know, rivers where there's a lot of fishing going on.

So we have not only the chemical. We also have the metals that we've got to be concerned about.

And, again, we fall back on our regulations, and our guidance document in terms of that.

MR. GRUVER: When is the -- available for the general public a copy of what your guidelines for sampling are?

CHAIRMAN SCHROCK: The sampling guidelines?

MR. GRUVER: Yes.

CHAIRMAN SCHROCK: Yes. We can provide you with our -- our sampling protocol for this site.

MR. GRUVER: I would like to have a copy. Reason being, I mentioned to the one gentleman that I had a spring on my property, which is your current sample point number twelve.

And the individual from Baker did not take it from the spring. But he took it from the sewage runoff from my neighbor.

CHAIRMAN SCHROCK: Well, they -- they had worst --

MR. GRUVER: Now, I had to direct --

CHAIRMAN SCHROCK: Plan that they had to follow to --

MR. GRUVER: To tell this college graduate what a spring was and what a spring was not.

CHAIRMAN SCHROCK: Well, I believe he took them from both, didn't he, eventually?

MR. GRUVER: Theoretically, he proved enough where he took them. That's why I'd like a copy of the results from whatever is marked your sample number twelve and number eleven.

CHAIRMAN SCHROCK: The --

MR. GRUVER: Number eleven was on my property. I mentioned that. And then he decided to move it off my property.

CHAIRMAN SCHROCK: We can -- we can provide you with --

MR. GRUVER: A very cordial individual.

CHAIRMAN SCHROCK: Yes. I remember the -- the incident. But, like I say, we can provide you with that data.

And we can provide you with a copy of the sampling protocol. I -- I could even give you level and detail of the analytical methods that they used --

MR. GRUVER: Okay.

CHAIRMAN SCHROCK: Even more complicated that I don't even bother to read those. But if -- if we need it --

MR. GRUVER: I would appreciate it.

CHAIRMAN SCHROCK: I'll make sure we write this down before we leave.

MR. GRUVER: Okay. Yes.

MR. DALLA PIAZZA: Yes. There were approximately a hundred and thirty different compounds that water analysis was screened for.

And the results that you would be getting are only those that showed valid results.

MR. GRUVER: Um hmm.

MR. DALLA PIAZZA: There was a number of different chemicals that were found. But, again, we're only addressing those that were most found throughout the site, and present the most health risks.

MR. GRUVER: Um hmm. Okay.

CHAIRMAN SCHROCK: Art, you're next.

MR. DALLA PIAZZA: Okay. So, generally, after you do the remedial investigation, the object of the whole study is to determine how or what action will be taken to remediate the examination that's found.

Do we have a question first?

MRS. GEIGER: Yes. It's Dorothy Geiger. What do you mean by metals found in the water?

Because we have rusty water. And they said it was from the iron ore. Because of having the iron ore.

You know, contents in the mine back there. Now, is that unsafe to be drinking? We put a filter on it.

But it doesn't take all of it out.

MR. DALLA PIAZZA: Okay. With the area of ground water, naturally, in the area there's a high level of iron, manganese, calcium, other metals that, although they don't have primary health risks, they have secondary factors that they consider in a drinking water supply.

Because they lead to staining of your sinks. They lead to corrosion or calcification or buildup in the pipes, that that leads you to have to replace your plumbing system every so often.

These are secondary considerations that they take into consideration for water --

ORIGINAL (Red)

public water supply.

But they don't have that much of a health risk.

MRS. GEIGER: Oh, they don't?

MR. DALLA PIAZZA: No. There were other metals that were found in the seeps that had higher levels and do have health risks.

These metals were, I believe, lead was one of the metals. And some other of the -- the heavier metals, that do have health risk associated with them.

MRS. GEIGER: Okay.

MR. DALLA PIAZZA: And that's one of the reasons why the third alternative is going to call for removal of the sediment where the higher metal contents were found in the seeps and sediment.

And, also, the -- the same organic constituents that we found in the ground water. So, primarily, then, in the selection of the alternative, you have to look at the site condition and the constituents that you found at the site that are proposing the health risk.

And the idea is to take action then to eliminate that health risk. The whole manner in which EPA decides what specific actions to take is

AR300694

conducted in a prescribed manner.

And these same reports, even though they might be different from site, they all go through the same selection process in determining the remedial action which will occur.

The -- the first reading of the types of action that can occur with the site is done to determine the categories of risk in which they could be broken down to.

But before I get into that, I think that, as I was saying, going through here tonight and seeing some questions as to both the direction that the contamination is moving, initially, when -- not that information was known about the site, the contamination movement was based, primarily on the groundwater levels and the groundwater gradients, and which direction the groundwater flow could occur.

Groundwater flow in the area follows the contour; pretty much similar to the ground contour.

And there's a flow direction that the constituents can take in the ground water. But, as we mentioned, these materials don't usually dissolve and move in the ground water.

They move by theirself, separate from the ground water. But they would generally follow the groundwater contour.

But, in this case, in this site, the ground water moves, not just by the groundwater gradient, but in relation to fractures that we talked about, which would be cracks or gaps in the bedrock structure.

And these, then, open up a channel in which the constituents, although they're following the groundwater contours, are more likely to move in one direction or another.

So, as you would follow the whole trace movement of these chemicals, you could see that they're branching out, following the groundwater contours.

But, again, if you follow the contamination level, you see that they're following groundwater flow channels for fractures in the bedrock geology.

It's directing them in a certain direction. And that is towards the west branch of the Perkiomen Creek.

And, then, that's in a -- again, an easterly, northeasterly direction. So, although their groundwater flow would make it likely that these constituents would be moving, not only that direction, but more to the north; and, possibly, even to the northwest.

And, as was initially found with the site and the groundwater contours, it's found that they're predominately flowing in these fracture bedrock.

And that is directing the movement.

Is that pretty much correct?

MR. TRIMBATH: Yes.

MR. DALLA PIAZZA: So, as EPA, then, would go down through their selection of alternatives, they have a large shopping list of all the types of actions that can be taken with any number of these sites that they're investigating and are going to provide a remedial action for.

The first category of the selection that they follow is a no action selection. You have to take into consideration.

Because it's within the legislation that they have to follow. They have to consider to take no action.

And, in this instance, what you're doing is, you are maintaining the current risk level, in this category.

The types of actions -- as they went down through the shopping list and they determined which technologies were available, and which would fit in with this site, they came up with a number of groupings.

And in this level, then, the first action there is to take no corrective action where you would be reducing risk, but to continue monitoring the existing wells and the surface water.

The second group of remedial action alternatives in that category would be that the surface water and the ground water would be continued to be monitored.

And they would install additional monitoring wells to further be able to tell in which direction these contaminants are moving.

The next step, then, in their categories is to provide a risk -- to prevent any further risk increase.

And, in this sense, you would select alternatives where the surface and the groundwater monitoring would continue.

And it would include the installation of additional water wells; and, also, a public water supply system.

ORIGINAL (Red)

So here you are preventing an increase in risk to anyone further, and to those individuals who are at the site, only reducing the risk for those individuals who might be currently exposed.

The next category or grouping would not only address a reduction of risk for those individuals who are currently exposed.

But they would exceed. They would meet or exceed all the ARARs. Now, the -- ARARs are abbreviation for Applicable, Relevant, and Appropriate Requirements for Regulations, that both the Federal and the State Government would have to regulate the cleanup at a site and, also, to select the alternative.

These types of regulations would be things like drinking water standards. We mentioned the MCLs.

MCLs are Maximum Contamination Levels that are set by EPA for public drinking water systems.

Anybody who is supplying water to the public, they have to test their water. And their water has to be below these maximum contamination levels in the supply that is given to the public.

ORIGINAL (Red)

The alternatives, then, in this selection process that were found that would meet or exceed these applicable and relevant appropriate regulations were those that both exceeded a reduction of risk to the individuals who are currently exposed, but would, also, reduce a risk or prevent further risk to anybody else.

And this is where, after you have the continuation of the monitoring program, an additional monitoring points, and installation of the public water supply, you get into a groundwater extraction, groundwater treatment and, then, discharge of that treated material.

Now, the difference between these two selections in this category here, [indicating], is that, in one case, there's a difference in the treatment technology.

In one case, we'll be using air stripping as the treatment process. And in the other case, the treatment process will be done by carbon adsorption.

So this is now in a -- you're going to be not only preventing the risk to the individuals who are currently exposed.

You're going to be reducing risk to the general population. And that's the human health consideration.

MR. GRUVER: What exactly is air stripping in what you're proposing? And what exactly is the other means you're proposing?

What does it entail?

MR. DALLA PIAZZA: Okay. We'll get into that in just a little while.

MR. GRUVER: Okay.

MR. DALLA PIAZZA: The other categories that would be taken into consideration would be those that exceed, those alternatives that would exceed human health and the environment.

Again, we're talking about the regulations that the Federal and the State Government has.

But you're not only talking about human health concerns. You're talking about environmental concerns.

The environmental concerns in this situation would be those on the surface stream discharge, or the discharge or reinjection on the treatment system.

And that's how these two

alternatives, then, are differing. In the last group, there was a surface water discharge. In this group, after the treatment occurs -- again, we're just talking about treatment by air stripping or by carbon adsorption.

ORIGINAL (Red)

The difference between that and this, [indicating], is that, instead of having a surface water discharge, where any -- anything that escapes the system would be going into the surface water, we are reinjecting.

The treated water is going to be reinjected back into the aquifer. Again, this is a more stringent requirement that would have to be met to reinject the water, and to discharge it to the stream.

The stream's discharge limitations would be set up underneath the water program, in which industries are allowed to discharge certain pollutant contaminant levels to a stream, depending upon the use of that stream.

With the reinjection system, they would have to meet more stringent requirements on the -- especially on the State level than on any discharge to a stream.

There is no contaminant level that

you would be allowed to discharge. So that you could maintain the current use of that stream body and allow for dilution in the stream.

ORIGINAL (Red)

With the reinjection system, they would have to meet a further, more stringent requirement in the contamination level that you're going to have to reach in the treatment process.

MR. GRUVER: Is there a prescribed requirement as far as how to monitor that whomever or whatever agency is doing this treatment prior to reinjection to make sure that they are doing that which they are supposed to?

MR. DALLA PIAZZA: Yes. Under the State requirements, that's a permitting system. Industry has to have a permit for this treatment process.

And the permit is both on the operation of the treatment plant, and on the level of contaminants that would be allowed in the discharge from that plan.

MR. GRUVER: How frequently are the discharges from that plant monitored, other than by the personnel working at that plant?

MR. DALLA PIAZZA: On the -- the State is the one who enforces these requirements.

AR300703

And underneath the Water Quality Program, I believe that that would probably be on a bimonthly basis, that the treatments are inspected, depending upon the industry involved.

ORIGINAL (Red)

And the amounts of technology can vary.

MR. GRUVER: What do you mean, "the industry involved"?

MR. DALLA PIAZZA: They have different schedules of inspection for different industries.

MR. GRUVER: What are you making reference to it being an industry in this case?

CHAIRMAN SCHROCK: We would have to meet the same requirements on our plants that we would require an industry to do.

It wouldn't be --

MR. GRUVER: But he --

CHAIRMAN SCHROCK: An industry here.

MR. GRUVER: But he indicated that, "a specific industry," indicating that various industries have different requirements.

MR. DALLA PIAZZA: Okay. A water pollution plant for municipal waste water treatment would not be inspected on as an increased basis as,

AR 300704

ORIGINAL (Red)

say, an electroplating plant that does electroplating and, then, has a treatment system before --

MR. GRUVER: What level --

MR. DALLA PIAZZA: Discharge.

MR. GRUVER: What level -- what industry would correlate to what you're doing here? Electroplation?

Electroplating?

MR. DALLA PIAZZA: There were --

MR. GRUVER: Or sewage --

MR. DALLA PIAZZA: Certain industries who --

MR. GRUVER: Treatment?

MR. DALLA PIAZZA: Used these solvents in their process. And not only do they get in separation from their specific system. They get a dilution in the plant.

So that, in some of these, in some industries, where they're using these types of chemicals, they have maximum levels that they can show in their routine monitoring basis for discharge.

MR. GRUVER: And this plant would be checked on that basis? You still haven't answered my question as to whether it would be monitored as though it were a sewage treatment, which has none of these chemicals, or if it would be monitored on the basis such as you presented, an electroplating facility.

MR. DALLA PIAZZA: I couldn't tell you exactly what --

MR. GRUVER: You don't know.

MR. DALLA PIAZZA: Monitoring rate they would exceed.

MR. GRUVER: You don't know.

MR. DALLA PIAZZA: No.

MR. GRUVER: Fine.

MR. DALLA PIAZZA: That's not in our program, our --

MR. GRUVER: That's all I wanted to know.

MR. DALLA PIAZZA: Water quality program. But, basically, they would be on a monthly basis to a biannual basis.

MR. GRUVER: So you have no idea at this point what the monitoring schedule would be?

MR. DALLA PIAZZA: Mostly, it's self-regulated by the industry, who submit the analysis. And, then, it follows up on it on a semi-periodical basis by the Department on a sampling --

MR. GRUVER: So, then, maybe once every six months it would be monitored.

MR. DALLA PIAZZA: By the --

MR. GRUVER: Is that your --

MR. DALLA PIAZZA: By who?

MR. GRUVER: By whatever governmental agency is required to monitor. Either EPA or the -- correct or no?

MR. DALLA PIAZZA: That's probably correct.

MR. GRUVER: Maybe once every six months.

MR. DALLA PIAZZA: Federally-established in the monitoring program will be established in the design.

It will be specifically stated in the design for this site, what the monitoring for the site will be.

MR. GRUVER: So at this -- at this time, the proposal which is being presented tonight is only -- the information is only partially available.

MR. DALLA PIAZZA: It's --

MR. GRUVER: Correct?

MR. DALLA PIAZZA: It's only a concept of what we're going to do, of what action, basically, we're going to take for the site.

It goes -- after we determine which remedial alternative will be selected, the next stage is design, in which you specifically sit down and you go through the whole design process, not only how the plant -- what the different types of equipment will be used for the plant.

But, included in this would be the monitoring that will occur for the extended time that the plant is operational, both for to determine the extent of the groundwater contamination, and whether that groundwater contamination is increasing or decreasing, the discharge from the treatment system and the -- again, we'd probably continue to monitor some of the private wells.

MR. GRUVER: As a novice, it seems to me that you have to have the information as to how you're going to safeguard someone from making a lot of money doing what they feel like doing, as opposed to what they're supposed to be doing and, thereby, poisoning a lot of people, which has been the case, not in this site, but in other situations.

So we, basically -- making

determination as to what direction to go without having complete grouping of information as to what is really the best way to go, making a decision without having all the information in.

MR. DALLA PIAZZA: I believe that we have been -- thoroughly investigated the site to the degree that we can make the decision at this time for selection of what type of treatment process that would be best for this site.

We have enough information, then, to go on and do a design for a treatment system that would address the constituents in the ground water.

CHAIRMAN SCHROCK: In the early part, we would certainly have to do more than a six-month basis of monitoring.

In fact, we -- we will have to develop a system of wells to make sure we're capturing where the ground water is, basically.

You know, since we have all these fractures, we're going to have to make sure that the wells we put in to extract the water are working.

There's going to be quite a bit of monitoring in the beginning. But I think once we have the system working, we're not only going to have to monitor what comes out.

We've got to monitor what comes in, so we know what our concentrations are.

MR. GRUVER: Logical.

CHAIRMAN SCHROCK: But if -- if, you know, if we go to an extent of a ten-year program, maybe by the tenth year, we may not have to do it on a bimonthly basis.

We may know or be familiar enough to know what we're doing and expand it to a six-month. But in the beginning, we clearly would have to do quite a bit of monitoring to make sure it's working, and to make sure the extraction wells are taking out the areas that we need.

MR. GRUVER: Okay. My major concern is to verify that things are being done as they should be done, as opposed to what just happens to get slouched off, and actually done.

CHAIRMAN SCHROCK: I understand.

MR. GRUVER: Do you follow my concern there?

CHAIRMAN SCHROCK: Well, they would prepare the bid specs so that somebody would be required to do certain number of monitoring, and to verify that the system is working.

Basically, EPA and the State would be

able to pay for that monitoring program up through ten years.

If we still find we are pumping following ten years, then, it would become a State responsibility to operate and maintain that system.

So I -- I think we have at least the flexibility within our program to know that the money is going to be available to do the things we're proposing to do.

Again, there would be a more detailed design specification.

MR. GRUVER: It's just that in my limited experience with what's going on here so far, I've seen some rather substantial, in my opinion as a novice, substantial blunders.

And if that is a -- blunders have been made in the initial stages, what's to prevent them after it's old hat, shall we say?

After everyone seems to -- "Okay. That problem's been taken care of. It's self-sufficient."

No one is no longer -- is greatly concerned about it, except the people who happen to live here.

CHAIRMAN SCHROCK: Well, once we see

that the concentrations are decreasing to a significant degree, we may be able to stop the system altogether.

We've seen dramatic decreases in concentrations, even without an extraction program within the five years and four years since we've been here.

We would expect natural attenuation. But since, at this point we haven't met even EPA standards, we feel we do need to go in and try and speed up the process to take out those chemicals that are there.

We know enough, I think, at this point, to be able to make a decision to begin a cleanup program, rather than do more investigation.

MR. DALLA PIAZZA: Okay. Again, if we go on here, now, you might be able to see some of the other considerations which EPA uses.

Yes. Another question?

MR. DANYLIW: My name is George Danyliw. That's D-a-n-y-l-i-w. Do you want to explain O and M, the maintenance program that's going to be involved.

MR. DALLA PIAZZA: Okay. With the -- with the selection of alternatives and the actual initial construction of the treatment plant, the operation then goes into a continuous period where the operation of the selected alternative of the treatment here and the alternate water supply --

MR. DANYLIW: Um hmm.

MR. DALLA PIAZZA: Would be overseen for an extended period of time to thirty years to see, not only that the treatment process is effective, but that it continues to supply and reduces the risks.

And that every five-year period, in cases where waste has not been totally removed from a site, it's reevaluated on a five-year basis, to see to what extent it's complying with the regional intention for the risk reduction at the site, and to see if it has met those requirements or not, and would continue.

So, not only do you initially just set it up. You don't just walk away and leave it. It's overseen for an extended period of time, which would extend up to thirty years.

MRS. STEHMAN: My name is Ruth Stehman, S-t-e-h-m-a-n. How long, knowing what you know now, how long do you think it would really take to clean this up?

MR. DALLA PIAZZA: Well --

MRS. STEHMAN: Because, you --

MR. DALLA PIAZZA: In the --

MRS. STEHMAN: You know, everything that --

MR. DALLA PIAZZA: In the concept with the plans, with the -- taking into the -- we know the concentration of the constituents and the general extent of the constituents.

The design was taken into consideration. The flow rate that the pumps can extract the contaminated ground water, and put it through the treatment process.

And on a general basis, in other types of situations, taken into that, these are all standard now, types of treatment plants that we'll be using.

The -- the rate at which the groundwater extraction occurs in passing through the treatment plant, and the number of what they call pore volumes -- and that's the general space that's in the ground water that's in the geology of the site, that's actual is taken up by ground water, it's estimated that it could take from, I believe, it was ten to forty years.

MR. GRUVER: That's great.

MR. GLENN: Are you familiar with a scavenger system? Have you looked at that?

MR. DALLA PIAZZA: And, again, sir, could we have your name and --

MR. GLENN: Peter Glenn, G-l-e-n-n. Have you considered using a scavenger system to pick up these -- these chlorinated solvents?

MR. DALLA PIAZZA: And what type of a system -- can you further explain what the scavenger system is?

MR. GLENN: All right. In Long Island, they've had a tremendous -- a large volume of gasoline -- of leaking underground gasoline and solvent tanks.

And what they do is, they drill a hole about two and a half feet in diameter, and sink it down to where it's leaking.

And they put down the system. It's called the -- it's called a scavenger. And it only allows the solvents to pass through it.

And they can pick up to quantities up to five gallons a minute. Very, very effective. And they cleaned up large areas very, very quickly by simply dropping these down at the points where it's moving into.

And I just -- I mean, I've seen these in operation. I've seen them work.

MR. DALLA PIAZZA: Is that a --

MR. GLENN: And it's very effective.

MR. DALLA PIAZZA: Is that a -- are we talking a large contamination level, just taking the top off?

MR. GLENN: Yes.

MR. TRIMBATH: I'm familiar with what you -- what you've mentioned. I've seen that work before.

And it works very well where the petroleum or whatever in the tank was at a very measurable depth.

What we have here -- in Long Island they have quite a bit of permeable material, sand and gravel, through which to extract the material.

Here we have just the opposite. We have quite a bit of fractured bedrock. The material that we saw has made its way through the soil and, matter of fact, left very little contaminants at the soil.

And the majority of the material is down within the fractured bedrock. And so the problem that we have is that we could be extracting material from a depth of a hundred and fifty feet in through fractured bedrock, where all the fractures could not be interrelated.

And so the -- this same system would not operate as efficiently here as it would in a situation such as Staten -- I mean, up -- up in Long Island, where they have different type of geology and a different type of material.

But we did -- that was one of the things that we did take a look at.

MR. GLENN: Okay.

MR. DALLA PIAZZA: Also considered, then, in the selection of the alternative were a number of considerations; the first of which was compliance with all applicable, relevant, and appropriate requirements.

And, again, we went over some of these, like the drinking water standards. Drinking water standards would be the contaminants specifics that are set for each individual constituents, which was found in the ground water.

Other types of relative and appropriate requirements would be location specifics.

In this case, there would be specific discharge limitations that the -- the Water Quality Bureau would set on stream discharge.

Because you're discharging to the Perkiomen, which is classified for a -- cold water fishes, and is actually trout stocked.

So this would set, then, locations specifics. Another type of location specific requirement would be that, in this case, the aquifer that we're talking about is an aquifer that is preserved for drinking water use.

So that our type of treatment process has to meet those standards where, in the future, this water can be used as a potable water supply, domestic water supply.

Other types of these regulations would be action specifics. In this case, it we're going to use -- be using a treatment technique like air stripping, the actual air stripping design of the system would have to undergo review, to see that it is operating in a safe manner, and that those people who are operating the plant are -- after exposed to the constituents as they're being treated.

So these would be action specifics,

and deal with the actual treatment technology. That's the first category we see here, [indicating], for ARAR compliance.

The second thing that would be considered was, is there an actual reduction of the toxicity, the mobility, or the volume of the contaminants that you're dealing with.

And in this case, we're actually looking and expecting a -- a degree of reduction of the contamination level.

And in their selection of alternatives, for six, you'll see that this does have a selected alternative -- will reduce the volumes and mobility and toxicity of the material.

Because not only is it going to prevent further spread of the contamination -- so you're containing the contamination.

It will actually reduce the contamination levels that are currently exposed and underground water at this location at the current time.

Another is the specific short term effectiveness. This reduces risk to the -- to the public and health and the environment on the short term.

And this selection, the alternate water supply would be that specific means that you would have a short term reduction into the current exposed residence at the site.

This alternate water supply would be extended to the residence. And connections would be made.

So that they would no longer be using the ground water as their domestic water supply; and thereby, reducing their risk.

So it would have immediate short term effectiveness. For -- the next thing is the long term acceptance and performance, reduces most of the risk.

In this case, not only would you have the reduction of risk by the alternate water supply. The actual treatment, the pumping and treatment of the ground water would reduce the risks so that they would be decreasing over a period of time, until such time as the system would then be turned off and it would -- it would be deemed, then, that the ground water would no longer propose a risk for a domestic water supply.

Again, the next type of selection and screening that has to go through is the

AR 300720

implementability of the selected alternative.

In this case, the treatment technologies that would be used are existing. They've already been used in other instances, and are found to be both effective.

They have -- also have available standard equipment and procedures that would be used in the construction and operation of the treatment processes.

So, again, to implement two -- implementation of the selected alternative is favorable.

Now, community acceptance is what we're here to gauge tonight. But, generally, we feel that since this selected alternative will meet all risk reduction levels, there should not be that much of a concern, then, for the future, and the operation of the site.

But I -- again, we're here to determine what your concerns are. And those will be further addressed in the -- the final record of decision.

The State acceptance, the selected alternatives do meet all the applicable, relevant, appropriate requirements, both for construction and operation of the treatment plants, and will most likely meet the reduction in risk levels for the drinking water of the area; also, any stream discharge or reinjection.

The last thing that we would consider, then, in our selections is the cost of the remedial action.

Again, we'll be using Federal funds in a Federal program that only has a limited number of funds to take to do the most good over the most area.

So, again, the consideration here is we have to be cost effective, so that the risk is both being reduced and in a most economical manner, so that the use of the funds are there to address other sites.

And the final, then, is protection of human health and the environment. And the reason that we are into the fourth category here for the expenditure of the funds, we are going to have both a public health and an environmental risk reduction for the selected alternative.

Now, again, you wanted to get into the type of alternative which is being selected. In this case, the most cost effective, and to reduce the risk at the site, is an air stripping technology, with the selected alternative in the treatment process.

You, initially, would get into the extraction. An extraction system would be established.

That extracted ground water would go into a stabilization tank. And this would level out the degree -- all the wells that would be pumped would have different levels of contamination.

And they would have different rates of extraction. It would go into an initial storage area, where you would level off both the contamination levels and the rate of flow for a balanced operation of the treatment process.

The initial treatment would be to remove precipitants and the metals from the ground water, not only because it is more efficient to remove them with a chemical treatment agent in this manner.

But it would also prevent operation problems in the air stripper portion of the treatment.

As to the initial pretreatment process, the organics are mainly removed in the air stripping process.

The problem with the air stripping process is that those organics that are stripped from the water or into the air columns would be diluted in the air column over the site.

So for the -- the selected alternative in this case would have a secondary carbon system that would capture from the air column the organic constituents.

In the design process, for the air stripping, we will also probably be looking at a secondary carbon polishing to see if it might be necessary to use secondary carbon polishing to meet the reinjection standards.

So the reinjection standards are going to be more stringent than a surface water discharge standard.

Within the air stripping, this would be done in a cylinder, which has a packing, in a cylinder -- there you go -- that exposes the water as it moves up through the air.

Now, this packing -- this packing actually exposes the greatest surface area of the water and -- to the air column that is actually moving within the sand media.

And all this packing material does is it just splits up the water into fine molecules. It moves up through the air.

And it's a mixing ratio of about fifty parts air to one part of water. The organics, then, move out of the water media and into the air, and are then removed in the air flow at the top.

And in this case, I believe, that the sizing here we're talking about a stripping column that is four foot in diameter, and thirty foot high, and has a treatment rate of 300 gallons per minute.

MR. GRUVER: What is done with the impurities that go out the air stack?

MR. DALLA PIAZZA: Again, that would be with the carbon filtration on the air stream. The organics are captured in the carbon.

The carbon is then removed and taken off site for disposal.

MS. VAN ELSWYCK: What are the treatment agents?

MR. DALLA PIAZZA: Pardon me?

MS. VAN ELSWYCK: The treatment agents. Before it gets in there? You're treating it.

MR. GRUVER: Yes.

MS. VAN ELSWYCK: With what?

MR. GRUVER: Pretreatment.

MR. DALLA PIAZZA: In the pretreatment?

MS. VAN ELSWYCK: Yes.

MR. GRUVER: Yes.

MR. DALLA PIAZZA: These are just the different materials that are used to floculate, like the iron, pH change.

You would add a chemical that would adjust the pH. The iron, then, would settle out with that pH adjustment.

There would also be other different chemical agents that are added to floculate out the calcium.

MS. VAN ELSWYCK: You're going to use one chemical to try to fight another?

MR. DALLA PIAZZA: To change the pH balance, yes.

MS. VAN ELSWYCK: It seems like it would be defeating the purpose to use one chemical to take another.

CHAIRMAN SCHROCK: It's -- it's sort of even like your swimming pools. You have to keep your pH level at a certain --

Original filed

MS. VAN ELSWYCK: Right.

CHAIRMAN SCHROCK: Balance. So it's more to keep a level at which those metals will actually drop out.

MR. DALLA PIAZZA: It's the same thing with a water softener.

CHAIRMAN SCHROCK: And then it goes into the next system.

MR. DALLA PIAZZA: What you're doing is, you're replacing one chemical in your water system with another.

And that's taken in the -- in the salts that are used in the water softening system. What we have to do is soften the water, so that those minerals and elements that are in the water do not cause a loss of efficiency in the air stripping.

And it would also be removing the other metals that do have a potential health risk.

MS. VAN ELSWYCK: Okay. And what happens to that sludge?

MR. DALLA PIAZZA: That's taken off site for disposal.

MS. VAN ELSWYCK: Where?

MR. DALLA PIAZZA: At a facility which is accepted for that material.

MS. VAN ELSWYCK: Trucked out?

MR. DALLA PIAZZA: Yes.

MRS. YANNONE: Send it to Russia.

CHAIRMAN SCHROCK: It would probably go to something like a solid waste landfill. Because it isn't hazardous materials.

It's --

MS. VAN ELSWYCK: Right.

CHAIRMAN SCHROCK: Metal content.

Now, the carbon, the difference in the carbon treatment is that you, basically, would have a large cannister of carbon.

And you would run the water through that. The difference being that you would have to use a lot more carbon.

And there would be a lot more carbon to expose of, of course.

MR. DALLA PIAZZA: So, basically, what -- what --

MR. GRUVER: Well, this would be --

MR. DALLA PIAZZA: This is different over the carbonized --

MR. GRUVER: Well, it's -- would this be a facility-type thing. What would be the physical difference in the different -- two different type facilities?

The carbon --

MR. DALLA PIAZZA: Between the -- the carbon -- straight carbon filtration system?

MR. GRUVER: Right.

MR. DALLA PIAZZA: Everything would just go through a carbon cannister. And everything goes off site.

MR. GRUVER: What would be the physical size difference?

MR. TRIMBATH: The -- the carbon cannisters come in a number of sizes. Most of them would be about half the size of the air stripping column.

The air stripping column, the efficiency of the column, is a function of how high it is in many cases.

And the carbon column is -- is a closed system, that's probably at least half the size of the air stripping column.

MR. GRUVER: So it would be physically smaller than the air stripping?

MR. TRIMBATH: Yes.

MR. DALLA PIAZZA: But wouldn't you be using a number of the carbon filters and --

MR. TRIMBATH: Right. And the air stripper needs a vertical column of a specified height, in this case, about thirty feet.

The carbon adsorption system is a little bit more flexible. It can be constructed differently, of a smaller configuration to about the size of fifteen feet.

Both systems have been used successfully through move these type of materials. So this isn't something that's new that's being looked at.

There are case histories that -- that these two systems have been used to treat the contaminants such as we have here to the levels that Tom was talking about.

MR. GRUVER: What are the advantages of this air stripping system to merit its choice?

MR. DALLA PIAZZA: Cost.

MR. TRIMBATH: Yes.

CHAIRMAN SCHROCK: Yes. We didn't really --why don't you go over the cost?

MR. DALLA PIAZZA: Okay.

CHAIRMAN SCHROCK: Just for those two.

MR. DALLA PIAZZA: The -- did you

have a copy? I didn't bring that one along.

MR. TRIMBATH: Yes. I did.

MR. DALLA PIAZZA: Between --

MR. BIKSEY: Go ahead.

MR. DALLA PIAZZA: Okay. Basically, the difference between the selected alternative categories.

When we got down to the categories which meet or exceed health risks, those were remedial action categories four and five.

Again, the only difference between those two were the difference between the air stripping and the straight carbon treatment system.

The estimated cost at present worth for remedial alternative number four, which was the straight air stripping or discharge would be in per thousand dollars.

That would be -- we'll say -- we'll raise it up to nine million, eight hundred thousand dollars in current eighty-eight dollars.

For carbon filtration and stream discharge, the cost would be fifteen million, three hundred thousand dollars.

CHAIRMAN SCHROCK: Basically, there's a five million-dollar difference --

MR. GRUVER: Um hmm.

CHAIRMAN SCHROCK: Between the carbon and treatment.

ORIGINAL (Red)

MR. DALLA PIAZZA: No increased -- no increased reduction in waste.

CHAIRMAN SCHROCK: And the cost is really disposal of the carbon, then, you would use.

MS. VAN ELSWYCK: Right. Yes. Because that would still contain --

CHAIRMAN SCHROCK: That would then be hazardous.

MS. VAN ELSWYCK: The contaminants.

CHAIRMAN SCHROCK: And we would have to dispose of it at a higher cost.

MS. VAN ELSWYCK: Right. Because I had one in the basement. And they had to get rid of it properly, the innards.

CHAIRMAN SCHROCK: So that -- that's your basic difference between them. Really, cost is the reason we're choosing air stripping.

MR. GRUVER: Bottom line is to save more money, more or less.

MR. DALLA PIAZZA: And, again, then, the difference between alternative number six and number seven, both of these were using reinjection.

And the added benefit is the reduction in environmental risk. The difference between these two treatment costs and current value dollars is ten million seven hundred thousand for the air stripping, and sixteen million three hundred thousand for the carbon system.

MR. GRUVER: What are the environmental benefits of number seven over number six?

MR. DALLA PIAZZA: None. They're both the same.

CHAIRMAN SCHROCK: Yes. There would be --

MR. DALLA PIAZZA: The difference is between six and four and seven and five --

MR. GRUVER: All right.

CHAIRMAN SCHROCK: Yes. Four and five are -- are putting it into the stream. Six and seven are putting it in reinjection.

There is one other benefit of reinjection. Again, this is something we're going to have to be checking on.

But by reinjecting the water, we would hope to be able to move the contaminants out faster, rather than discharging --

MR. DALLA PIAZZA: It would reduce the stream --

CHAIRMAN SCHROCK: Into the --

MR. DALLA PIAZZA: We would also be able to maintain the groundwater levels, and affect less of the area ground water, which may lead, if we go with a direct pumping system, treatment and stream discharge.

We would be dewatering the aquifer. So no longer, not only would we be affecting those people have a current risk.

We would be removing some water supply on other residents in the area. We would also be --

MR. GRUVER: How many gallons per week are you talking, or a day? How many gallons per minute, or per whatever unit of measure you're using for whatever you're talking about?

MR. TRIMBATH: The system's right now designed to operate at about 210 to 300 gallons per minute.

But that can be modified, based on further design. But the estimate that we have now and the systems that we have here, and we have priced here, can operate within that range.

MR. DALLA PIAZZA: And you're talking about, within one week, decreasing the water level in the cone of depression on these pumping wells fifty feet.

That -- was that one -- one answer was forty foot?

MR. TRIMBATH: I think about forty. Closer to maybe to about thirty and forty-five.

MR. DALLA PIAZZA: And then that cone of depression or the water label tip that you're pumping from, over the period of time of operation, would keep getting lower and lower and lower.

One of the considerations was -- is in that dewatering, we may leave some of the constituents or contamination high and dry, and not in the pumping system.

We were trying to extract it. So that we would start pumping. And we'd get a, you know, a real good decrease in the contamination level, and say, "Okay.

"We've cured everything." And, then, we'd let the -- the water system return to normal. It would go back up, recontact with that contamination and, then, start moving it, again.

So that was another one.

MR. GRUVER: Well, have --

MR. DALLA PIAZZA: There's not only a benefit here for reduction of risk in reinjection. But there's also other benefits that were taken into consideration for reinjection, was chosen over surface water discharge.

MR. GRUVER: Have you considered the disadvantage of the human factor, or human error factor being introduced by doing it in this manner?

MR. DALLA PIAZZA: Pardon me?

MR. GRUVER: Have you considered the disadvantage of the human factor, or human error factor being introduced by doing it in this manner?

Or is -- whereas, in effect, if someone is not effective in what they're doing, they could actually be polluting a greater area than already was polluted?

CHAIRMAN SCHROCK: If --

MR. DALLA PIAZZA: They would already be doing that.

MR. GRUVER: By --

CHAIRMAN SCHROCK: If they would be going back into the area that would be --

MR. GRUVER: If they're reinjecting water that --

AR 300736

CHAIRMAN SCHROCK: That would be --

MR. GRUVER: Into additional wells outside the core area, as is, I believe, is provided with by your map, would you not be running the risk of --

MR. DALLA PIAZZA: Okay. We --

CHAIRMAN SCHROCK: We would --

MR. GRUVER: Polluting a broader area?

CHAIRMAN SCHROCK: What we would be after here is seeing that the water we reinject would then be going back into the recovery wells.

MR. GRUVER: Figure number six on your handout, or your --

CHAIRMAN SCHROCK: Show him your recovery wells.

[Presentor examining documents]

MR. DALLA PIAZZA: Let me put this up here.

CHAIRMAN SCHROCK: That's it.

MR. DALLA PIAZZA: This is the concept design for the extraction wells, which would appear down along the Perkiomen seeps.

The water -- the east portion of the site.

MR. GRUVER: But the extraction wells are not really in the heart of the supposed contaminated area.

ORIGINAL (Red)

MR. DALLA PIAZZA: No.

MR. GRUVER: What is the logic to that?

MR. DALLA PIAZZA: The idea is that we're not only containing -- we're not only trying to prevent the movement of that.

We're trying to recover the contamination. Now, these pumping wells only have a certain areal extent that they can affect the ground water.

And we figure that those wells could affect a radius area of thirty feet or more?

MR. TRIMBATH: Right. About -- right.

MR. DALLA PIAZZA: About thirty foot. So that --

MR. GRUVER: Then --

MR. DALLA PIAZZA: As we put in this barrier for the migration of ground water and the -- the contamination, we'll be able to pull some of the material back, initially.

And we will be able to get the

maximum the contamination levels. So that in -- what we have drawn here are the trace area.

This line, [indicating], of wells was put on at the maximum contamination level of the MCLs for the constituents that we're going to be removing.

The contamination will be intercepted and extracted with the extraction wells.

MR. GRUVER: That is the major or largest percentage of --

MR. DALLA PIAZZA: What you see is on the trace. Any detection.

CHAIRMAN SCHROCK: Again, this is just the concept. We're going to have to further define.

We're going to have to place those wells, and make sure they are extracting where we want them to be extracting from.

MRS. STEHMAN: You just brought up an interesting point. You're going to be dragging -- pulling all this water out of the ground.

How about those of us who have wells who are not affected and are not on a supplemental system?

What are we going to be doing for our

water?

MR. DALLA PIAZZA: Well, again, that's the idea with the reinjection. We --

ORIGINAL (Red)

MR. GRUVER: What do you mean, that's the --

MR. DALLA PIAZZA: We would be reinjecting the water. Not -- we wouldn't be dewatering the system.

MRS. STEHMAN: You're certain of that?

MR. DALLA PIAZZA: This is done so the -- in the design consideration.

CHAIRMAN SCHROCK: We would be monitoring to make sure that we're not doing something of that nature.

MRS. STEHMAN: Is there any chance of the wells running dry? You know. And what do we do if that happens?

I mean, you talk about the geology and all the fractures, and everything being a little unpredictable in this area, which leads me to believe that, perhaps, it's also difficult to predict exactly how things are going to work.

CHAIRMAN SCHROCK: Um hmm.

MRS. STEHMAN: Everything's great on

paper. But reality is a different matter. Do you have anything in mind?

MR. DALLA PIAZZA: Well, not only does this alternative have the injection system. It has a monitoring.

MRS. STEHMAN: Um hmm.

MR. DALLA PIAZZA: It has also installation of further monitoring wells. And the design, before we go into design, we'll probably be doing a little bit further investigation, even as we're -- a little more extensive on those specific concerns, now that we've selected the alternative.

We have to gather a little bit more information to specifically do the design.

MRS. STEHMAN: All right. Because you just say in here that you're looking for an alternative -- an alternate water supply.

That's on page eight. And you mention it, again, on page thirteen. And I did want to know what you meant by an alternative water supply.

MR. DALLA PIAZZA: Okay. We -- we have come up with, I guess, a few alternatives, in this case.

MRS. STEHMAN: Well, for what

purpose? What is your -- if you -- if you're going to be reinjecting, what is the purpose of an alternate water supply?

MR. DALLA PIAZZA: Well, initially, right now, there are people at risk.

MRS. STEHMAN: There's what?

MR. DALLA PIAZZA: People at risk.

MRS. STEHMAN: Okay. You mean people who do not have a supply -- an alternate supply right now?

MR. DALLA PIAZZA: Right. Because they're using the ground water. And that ground water has, anyway, to some extent, a trace contamination.

There --

MRS. STEHMAN: So --

MR. DALLA PIAZZA: There are a number of residents who have an alternate water supply which was put in by EPA in their initial removal action.

Let me see if I can get that one up there. There is currently an alternate water supply for four residents.

MRS. STEHMAN: Well, it -- it's pretty much to maximum right now.

MR. DALLA PIAZZA: Right. So we can't extend that water supply --

MRS. STEHMAN: Right.

MR. DALLA PIAZZA: And use it to supply up to, let's say, approximately twenty-four residents.

MRS. STEHMAN: Well, where are these people?

MRS. GEIGER: Where --

MS. VAN ELSWYCK: Where are these locations?

MRS. STEHMAN: Where's the location of this?

MR. DALLA PIAZZA: It's estimated, okay, for the extent of that -- we don't have anything with the --

MR. TRIMBATH: That would be in the other report.

MR. DALLA PIAZZA: Yes. Okay. I guess the only thing we would have along that line would be -- if you get a map out.

[Presentor examining documents]

MR. DALLA PIAZZA: Okay.

CHAIRMAN SCHROCK: I think, basically, they're looking at the area which they're showing here, [indicating].

Knowing that the plume is heading east, we may go down Walker Road, somewhere in that direction, [indicating].

Again, these are things -- it's not that people are at risk right now. But we know it's moving.

MRS. STEHMAN: Right.

CHAIRMAN SCHROCK: And we want to be able to assure those people that -- that they're not going to be having a problem.

MR. DALLA PIAZZA: And they're in the area, like we said, where the wells might be only affected by other actions that are being taken with the ground water manipulating that will be occurring.

In this instance, although it will be further qualified in the design, as to which residents which might have alternate water supply provided for them, we're looking at the Benfield Road --

MR. GRUVER: Which is --

MR. DALLA PIAZZA: Coming down.

MR. GRUVER: Benfield?

MR. DALLA PIAZZA: Here.

[indicating].

MRS. YANNONE: The one that runs beside, Karl.

CHAIRMAN SCHROCK: And horizontal now.

MR. DALLA PIAZZA: This would be Walker Road --

MRS. STEHMAN: Right.

MR. DALLA PIAZZA: Going in towards the Gap.

MRS. STEHMAN: Yes. Um hmm.

MR. DALLA PIAZZA: We're talking, then, about both sides of Benfield Road, and on both sides of Walker Road, extending -- what would you say -- 500 yards?

MR. TRIMBATH: Yes. Um hmm.

MR. DALLA PIAZZA: Approximately 500 yards in either direction from the interchange with Benfield Road, [indicating].

CHAIRMAN SCHROCK: Now, again, what they'd really be proposing is to, let's say, a water line of some sort, putting the connections through the road, up to the house.

It isn't a mandatory thing that you have to take this kind of a supply. But we would be able to at least put in a system so that it would be available to people.

MS. VAN ELSWYCK: Has anyone taken in consideration the borough bringing in water?

MR. DALLA PIAZZA: The -- again, for the -- if you're going to be supplying twenty-four residents the -- the amount of volume that you would have to transport, it would not be cost effective just to transport that amount of water in.

MS. VAN ELSWYCK: Okay. But in -- in the future, you could be dealing with, maybe, a hundred people.

I mean, you're assuming twenty-seven will be affected in the near future. You don't know what that plume is going to do.

MR. DALLA PIAZZA: No. That --

MS. VAN ELSWYCK: They --

MR. DALLA PIAZZA: That's -- that's the --

MS. VAN ELSWYCK: Hey, they told --

MR. DALLA PIAZZA: That's the whole concept of -- the whole concept of what's --

MS. VAN ELSWYCK: They told me it wasn't going to really affect more than four people. Now, that was five years ago.

Five years down the road, you could affect a hundred people.

CHAIRMAN SCHROCK: Well, we're looking at the potential effect. But you're right.

MS. VAN ELSWYCK: Right.

CHAIRMAN SCHROCK: We are expanding it on the potential.

How far away is the borough?

MS. VAN ELSWYCK: Well --

MRS. YANNONE: It's down that way.

MS. VAN ELSWYCK: Yes. Six miles, I believe, is the last resident hookup.

MS. VAN ELSWYCK: To me, that would be the most logical solution to alleviate the problem.

CHAIRMAN SCHROCK: I will admit at this point we haven't completely decided where that alternative water would come from.

MS. VAN ELSWYCK: Um hmm.

CHAIRMAN SCHROCK: All right? We have some ideas which, if he wants to go over it, we could.

But --

MS. VAN ELSWYCK: Right.

CHAIRMAN SCHROCK: Again, that --

MS. VAN ELSWYCK: But that would --

CHAIRMAN SCHROCK: That's something I would definitely --

MS. VAN ELSWYCK: That would alleviate someone running it --

CHAIRMAN SCHROCK: Want to consider.

MS. VAN ELSWYCK: Right. But monitoring it, you wouldn't have all of that. The borough is already doing it.

CHAIRMAN SCHROCK: It would be nice to have an authority who's already supplying. Because --

MS. VAN ELSWYCK: That's right.

CHAIRMAN SCHROCK: We can --

MS. VAN ELSWYCK: Right.

CHAIRMAN SCHROCK: Turn the system over to somebody to operate. I -- I agree with the idea.

MS. VAN ELSWYCK: That's right. Because I'm operating the other one. And it is not a --

CHAIRMAN SCHROCK: But to run water that far --

MS. VAN ELSWYCK: Job.

MR. DALLA PIAZZA: And the --

although the current supply only has four --

CHAIRMAN SCHROCK: Has some problems with the line.

MR. DALLA PIAZZA: Connections for residential connection. This -- with twenty-four residential connections, would get into a whole new regulatory program, which is the public drinking water supply.

And it's, then, regulated by the State.

MS. VAN ELSWYCK: Right. But who runs it? I mean, where are you going to start from?

MR. DALLA PIAZZA: Whoever is operating the plant would have to be inspected by the State, and its operation.

MS. VAN ELSWYCK: Okay. In other words, whoever gets the contract to operate that -- that treatment plant, they --

MR. DALLA PIAZZA: No. Not the treatment plant.

MS. VAN ELSWYCK: Okay.

MR. DALLA PIAZZA: If that -- that is an alternative for water supply --

MS. VAN ELSWYCK: Well, that is what I'm asking.

MR. DALLA PIAZZA: The treated water from the treatment plant.

MS. VAN ELSWYCK: Right. Who would be responsible?

MR. DALLA PIAZZA: But it may not be an acceptable alternative.

MS. VAN ELSWYCK: But if it is an acceptable alternative, who would be responsible for that water system?

MR. DALLA PIAZZA: The contractor.

MRS. ERNEY: Not the twenty-seven people that are --

CHAIRMAN SCHROCK: That would fall back on the State and Federal operation.

MRS. ERNEY: Sandy Erney; E-r-n-e-y. She runs the one for four. If it breaks down, she calls the plumber.

She does whatever. So twenty-seven of us are on there. It breaks down or whatever. Who takes --

MS. VAN ELSWYCK: There's --

MRS. ERNEY: Care of that?

MS. VAN ELSWYCK: An entity to control that.

MRS. ERNEY: You're going to control

it forever and ever and ever.

CHAIRMAN SCHROCK: That's one possibility.

MR. DALLA PIAZZA: That's why this alternative is --

CHAIRMAN SCHROCK: The other is --

MRS. ERNEY: It's not going to be like hers?

CHAIRMAN SCHROCK: I -- I know what you're getting at. We -- we do not want to make it that kind of a system.

I wish I had a better answer on exactly where the water will come from, and how it will operate.

MS. VAN ELSWYCK: Well, we know that's not the alternative. But if it is one --

MRS. ERNEY: Who --

MS. VAN ELSWYCK: This gives us the basics.

CHAIRMAN SCHROCK: And you're, basically, saying you would prefer to have it with some water authority that --

MS. VAN ELSWYCK: Definitely.

CHAIRMAN SCHROCK: Already knows how to operate the system?

MS. VAN ELSWYCK: Definitely. Definitely.

ORIGINAL (Red)

MRS. STEHMAN: And it would be preferable to have it with the Borough of Topton, rather than the local trailer park.

Because the local trailer park will use that for political gain in the end.

MRS. ERNEY: Not only that, it's going their way.

MR. GRUVER: The contaminants are going the direction of the trailer park.

MRS. ERNEY: They're going that way now.

MR. DALLA PIAZZA: But, again, the whole alternative with selection that was taken here is that the selected alternative is to prevent migration of the constituents.

Because it's going to capture, with the extraction system. So there isn't going to be any further migration in that direction.

Secondly, the -- it would reduce and remove the contamination from the existing aquifer system, here, [indicating].

The reason we chose not only for reinjection were for reduction of risks, but a reinjection system will have more control in the removal and extraction of these constituents.

ORIGINAL (Red)

It will occur over a shorter period of time. And not only will we be able to effect the rate of movement in extraction.

We also hope to be able to effect as these constituents are sinking in the system, the reinjection system would put the injection of the water at a lower level, and make a gradient of water, groundwater flow, from deep in the system to shallower parts.

So that we would also not only prevent the migration on horizontal. We would also prevent migration downward in the system.

Yes?

MS. VAN ELSWYCK: Okay. To go back on that treatment area. It will be monitored by DER and EPA.

But not put there and run by.

MR. DALLA PIAZZA: No.

MS. VAN ELSWYCK: In other words --

MR. DALLA PIAZZA: It would be under contract.

MS. VAN ELSWYCK: It would be subcontracted to someone other than a governmental agency.

MR. DALLA PIAZZA: Most likely.

MS. VAN ELSWYCK: Then, you would monitor it from there?

MR. DALLA PIAZZA: Yes. We would oversee his operation. And, normally, it would be the State of Pennsylvania, after a certain time period.

And, see, in this -- in this type of selected alternative, where you are treating ground water --

MS. VAN ELSWYCK: Um hmm.

MR. DALLA PIAZZA: It -- it's under joint EPA and DER operation for the first ten years. And, during that time period, we're seeing how well, or how effective, this system is operating on a certain period, not to exceed five yacrs.

The selected alternative would be viewed to see if it is performing --

MS. VAN ELSWYCK: Okay.

MR. DALLA PIAZZA: As it was initially concept designed to --

MS. VAN ELSWYCK: Does this contract go out to bid like -- like it did before?

CHAIRMAN SCHROCK: It would be a

federally-funded project, and would go through all the extended process of spending --

MS. VAN ELSWYCK: Okay.

CHAIRMAN SCHROCK: Federal money.

MS. VAN ELSWYCK: Well -- that's got to be --

CHAIRMAN SCHROCK: One comment you made about the trailer park; should that alternative be considered, he would, then, have to become a permitted system, as well.

MS. VAN ELSWYCK: Don't even consider it.

MR. GRUVER: No.

MS. VAN ELSWYCK: Don't even consider it.

MRS. YANNONE: No.

MRS. GEIGER: Yes. Don't.

MS. VAN ELSWYCK: That would be a --

MR. GRUVER: I would like to go on record as being firmly against any dealings with the water system in any affiliation with the trailer park water system.

Would anyone else also like to go on record?

MRS. STEHMAN: All of us.

MRS. YANNONE: All of us.

MRS. ERNEY: Yes.

MRS. GEIGER: All of us.

MS. VAN ELSWYCK: All of us.

MRS. YANNONE: You got it.

MRS. STEHMAN: Yes.

MS. VAN ELSWYCK: It's just so they rule it out. That's why we brought it up.

CHAIRMAN SCHROCK: Yes.

MR. DALLA PIAZZA: Okay. We -- we have not made any decision on where --

MS. VAN ELSWYCK: Right.

MR. DALLA PIAZZA: It would come from at --

MS. VAN ELSWYCK: But there's no --

MR. DALLA PIAZZA: Point.

MS. VAN ELSWYCK: Use going into all manpower, figuring out how it would work, upgrading his system, hooking us into it, et cetera, when there's no one that would agree to it.

MR. GRUVER: If a roll call vote on that matter would affect it in any way, I'm sure everybody would like to go through the --

MR. DALLA PIAZZA: How many of you would like to drink the treated water?

[Laughter]

MR. GRUVER: That is why we asked.

MS. VAN ELSWYCK: No. That's why we asked. Preferably, we want borough water.

MR. DALLA PIAZZA: Borough water?

MS. VAN ELSWYCK: Yes. That should go on record. Yes.

MRS. GEIGER: Dorothy Geiger. I was just going to ask what the approximate cost of having water come in would be.

Would you pay that piping the water up? Or do we have to pay that, then?

MR. DALLA PIAZZA: With the --

MRS. GEIGER: I know there's a --

MR. DALLA PIAZZA: With the alternative water supply, like off of a existing public supply, we would pay for the installation of the system, and the connection of the system.

And that's it.

MS. VAN ELSWYCK: You pay per gallon, then.

MRS. GEIGER: Yes. You pay per gallon. That I can see. But I thought maybe we had to pay so much to hook up the water.

MS. VAN ELSWYCK: Yes.

MR. GRUVER: Does DER or EPA, whomever's pocketbook it's coming out of would pay for the entire installation and hookup?

ORIGINAL (Red)

MR. DALLA PIAZZA: Yes.

CHAIRMAN SCHROCK: Yes.

MR. GRUVER: And hookup?

MR. DALLA PIAZZA: Yes.

CHAIRMAN SCHROCK: Yes.

MS. VAN ELSWYCK: They did before.

MR. GRUVER: Provided we want it.

MS. VAN ELSWYCK: Right. They did before.

CHAIRMAN SCHROCK: And if you didn't, we would still run it up to the house.

MR. DALLA PIAZZA: From there on, you're dealing with your water supplier.

MRS. GEIGER: Okay. Fine. My other question was going to be, how soon would you be starting?

If you have to send out bids and everything else, it could be another year or more?

[Laughter]

MS. VAN ELSWYCK: Yes; or more.

MR. GRUVER: Or more. Or more.

MRS. GEIGER: Well, our -- our water

pump is giving out. And I'm wondering if I should go and invest and buy one.

[Laughter]

MR. DALLA PIAZZA: Can you rent one?

MRS. GEIGER: No. I doubt it. Well, what is it that -- our -- we're just opposite that triangle on Walker and Benfield.

And our well is only thirty-three feet deep. So I take it that we'll probably be one of the ones that's affected by pumping water out.

MR. DALLA PIAZZA: Um hmm.

MRS. GEIGER: Because we're only a little thing. So we will probably be first to go.

MR. DALLA PIAZZA: Again, it would be further considered in the design as to how many connections there would be.

CHAIRMAN SCHROCK: Are there any other questions that the people might want to ask before we close up shop?

And even after we shut down, we'll stay around to talk a little more.

MS. VAN ELSWYCK: Okay. Real quick, when will we be told what the decision is?

CHAIRMAN SCHROCK: I would expect the comment period ends the 28th of this month. And I would hope to have the decision made before the end of this month.

So --

MS. VAN ELSWYCK: That would --

CHAIRMAN SCHROCK: October.

MS. VAN ELSWYCK: What decision? The contract, or the -- the --

MR. DALLA PIAZZA: The record of decision, as to what selected alternatives would be.

MS. VAN ELSWYCK: What the alternative would be.

MR. DALLA PIAZZA: Yes.

CHAIRMAN SCHROCK: And that would be to the extent of an alternate water supply; not where that comes from.

MS. VAN ELSWYCK: Right.

CHAIRMAN SCHROCK: It would be -- you know, this is still, like we said, the comment period remains open until --

MR. GRUVER: Like we said, the -- the air stripping --

MRS. STEHMAN: Are we going to be on the mailing list, the regular mailing list?

CHAIRMAN SCHROCK: Yes. We know the regular mailing list. We can certainly --

MRS. STEHMAN: Okay. That would be fine.

MR. DALLA PIAZZA: We do need some corrected addresses; and, also, some resident property ownership changes.

CHAIRMAN SCHROCK: And I would try to get a copy of the record of decision, the text, here in the township building, so that someone could get a look at it.

MR. DALLA PIAZZA: At the end of --

CHAIRMAN SCHROCK: It's not going to be more than like twenty-five or thirty pages.

MR. DALLA PIAZZA: At the end of the proposed time, the proposed alternatives are available.

That is right up front, there, [indicating].

MR. GRUVER: Who is making this determination?

CHAIRMAN SCHROCK: EPA, really, makes the determination, with the concurrence of the State.

Because it's really more our money than theirs. The State will put up a ten percent match.

And the Federal Government would put up ninety percent match.

MR. DALLA PIAZZA: Taking into consideration the comments submitted by the public.

MR. GRUVER: It's just EPA. What -- the Philadelphia office, or --

CHAIRMAN SCHROCK: Yes. Region III. The Regional Administrator is James Seif. And he will be responsible for signing this document.

I will basically be responsible for writing it up. But they make the decision in terms of they sign it.

Do you want an address there, too?

MR. GRUVER: No. Just the gentleman's name.

CHAIRMAN SCHROCK: James Seif. That's his name. S-e-i-f. Middle initial is "M."

MR. GRUVER: Okay.

MR. KOLLER: We want to thank you for coming. And if there aren't any more questions, as Roy said, we'll be around here for a few minutes if you want to come up and ask some specific questions, some personal questions, or that have to do with your own situation, you're welcome to do it.

The other thing is, please, if you

haven't registered with us, we know that the post office changed some addresses around here.

ORIGINAL (Red)

Make sure that we do have your current address on our sign-in sheet at the rear.

MR. GRUVER: One comment or question with regards to this reinjection; if, in fact, as you stated, your -- there is some degree of doubt as to exactly where these cracks in the bedrock -- what direction they run, what assurance do we have; me, specifically?

Because the direction -- I'm outside the realm of where you're -- you're drilling -- that you do not contaminate my existing well water?

North. North and northwesterly, from the initial point. If in fact you don't know the direction of the -- of the fissures, of the cracks, or whatever term you choose, I do have a spring which I have not yet been permitted to see the results of the samples from.

That -- that spring does not become contaminated, as well as some other things.

MR. TRIMBATH: If I could answer your question, first of all, we have -- when the system goes in, we still have a very elaborate system of all the monitoring wells in place.

And those wells are monitoring as the system comes up to speed, and as it comes up to treatment.

ORIGINAL (Red)

Also, additional work will be done, specifically geared toward that nature of defining the materials, defining the geohydrology in more detail.

The system is set up. It's very flexible. We mentioned that contaminants were encountered from the surface down to about a hundred and fifty foot.

The wells would be constructed. As I said, we can extract water from any level. They can also inject water at different levels.

So the system is being designed to be very flexible. There are systems within the process that the existing ground water can be monitored as the system goes through.

And so we're taking the care to put in those type of safeguards, so that we don't get in a situation where we dewater someone's well, or that we make the situation worse.

MR. GRUVER: Well, what happens if they go from a situation where I assume that the water is clear because I have not received a copy of it yet and, then, it becomes slightly tainted?

Is that considered to be a negligible, less expensive alternative than the shutting down the ten-million-dollar, or whatever price tag facility, thereby, one resident has his water poisoned, just slightly?

But we'd rather have that than dig up our ten-million-dollar project. Is that the basic response that would be --

CHAIRMAN SCHROCK: Well, it's certainly not the intent.

MR. GRUVER: Would that -- is that what is a feasible alternative, a feasible possibility?

CHAIRMAN SCHROCK: I -- I would expect not. I mean, I think we're dealing with contaminants that are easily taken out of water.

I would not expect there to be a trace of anything in --

MR. GRUVER: Is that a distinct possibility?

CHAIRMAN SCHROCK: Well, I -- I think your -- our most realistic possibility is that what goes back in will have completely no contaminants --

MR. GRUVER: Is that a distinct

possibility?

CHAIRMAN SCHROCK: Left in it. What? That we could reinject contaminants back in? I'd say, "Yes."

MR. GRUVER: Thank you.

CHAIRMAN SCHROCK: But we also want to make sure that our recovery wells are taking it all out.

MR. GRUVER: Basically, what you're saying is that, if, in fact, they were to taint my well, that's life.

CHAIRMAN SCHROCK: Well, I mean, no. That -- that's not what I'm saying. I'm saying it's a possibility.

Because we'd certainly have that implemented it. And people are human. I mean, you're asking a question --

MR. GRUVER: Such as the people who took the samples, and --

MR. DALLA PIAZZA: What would be the probability of your supply becoming contaminated with the migration of this chemical, over our installing the system, to reduce that migration?

MR. GRUVER: I don't know. My question is, do you know?

MR. DALLA PIAZZA: Well, it would be more likely that your well would be contaminated, or your spring would be contaminated by the --

MR. GRUVER: By the reinjection.

MR. DALLA PIAZZA: The migration of the existing contamination, than us taking corrective action, which is --

MR. GRUVER: I would say it would be less likely that it would become tainted by migration, considering the direction of flow --

MS. VAN ELSWYCK: Huh uh.

MS. YANNONE: Huh uh.

MR. GRUVER: Is not in that direction.

MS. VAN ELSWYCK: Wrong. No.

MR. DALLA PIAZZA: You've got me wrong, again. I said --

MS. VAN ELSWYCK: Yes.

MR. DALLA PIAZZA: The ground water migrates to the north, the northeast, and --

MR. GRUVER: You indicated that it was going --

MR. DALLA PIAZZA: That's the groundwater movement. As you can see, we had that general area of trace --

MR. GRUVER: Right.

MR. DALLA PIAZZA: Contamination. But it's moving in this direction, [indicating], also.

ORIGINAL (Red)

The majority of the contamination is falling to bedrock fracture, and moving onto the east; the highest contamination.

But, as it's doing that, it's also spreading out. It's following the groundwater movement.

But it's following groundwater openings in the rock channel more, than the groundwater movement.

It's spreading. It's going out in all directions, downgradient --

MS. VAN ELSWYCK: Right.

MR. DALLA PIAZZA: Groundwater movement. But it's -- has a deferred direction in which it's moving.

MR. GRUVER: Do you -- do you have any sort of underground map, as it were, as to what that, let's say, two-square-mile radius?

MR. DALLA PIAZZA: Two square miles, no. Our study was extensive. But --

MR. GRUVER: One square mile?

CHAIRMAN SCHROCK: I don't really want to cut you off.

ORIGINAL (Red)

MR. GRUVER: You just did.

CHAIRMAN SCHROCK: But I would sooner have you come up and go over this. Because you're really --

MR. GRUVER: You don't want it on public record? Correct. Thank you.

CHAIRMAN SCHROCK: No. That's not what I'm saying. I'm saying you're asking questions about your own source.

The meeting can end. And we can continue to discuss that. Okay? If you want to go on record, I'll ask her to record the conversation for you.

But I think it's time to end the meeting. We're more than willing to sit and discuss it further.

Okay?

MR. GRUVER: I have no choice, have I?

CHAIRMAN SCHROCK: Well, I guess not. I mean, you -- you're trying to box me into a corner here.

And you're doing it.

ORIGINAL (Red)

MR. GRUVER: I'm trying to get a definitive answer.

CHAIRMAN SCHROCK: Well, you're asking. And I answered it. There is a possibility. Yes.

And he's trying to answer, again, even further, the direction of the groundwater flow. If you want to go over this, again, and you want it on record, we'll continue to discuss this.

But as far as I'm concerned, these people may leave if they would like. And they certainly could stay if they would like.

Okay?

MR. GRUVER: It's not my decision to make.

CHAIRMAN SCHROCK: Fine.

Off the record.

[Whereupon, at 8:39 p. m., the proceeding was concluded]

CERTIFICATE OF NOTARY REPORTER ORIGINAL (Red)

I hereby certify, as the notary reporter, that the foregoing proceedings were taken by me, and thereafter reduced to typewriting by me or under my direction; that this transcript is a true and accurate record to the best of my ability; that I am neither counsel for, related to, nor employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of the action.

BY Antoinette S. Caswell

Antoinette S. Caswell

Notary Public in and for the
Commonwealth of Pennsylvania
West Fairview, Pennsylvania

My Commission expires:

August 3, 1992

The foregoing certification does not apply to any reproduction of the same by any means, unless under the direct control and/or supervision of the certifying reporter.